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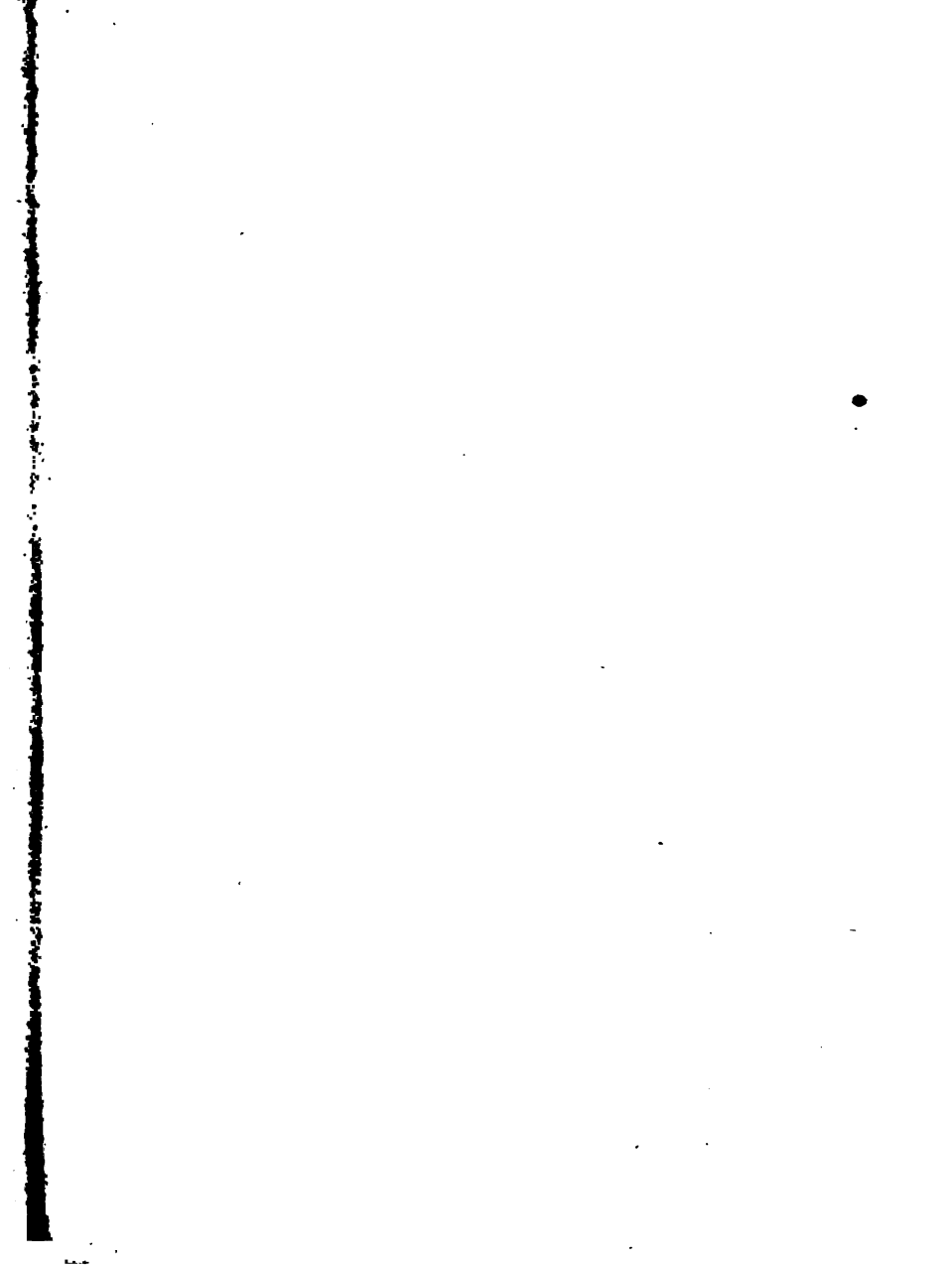
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PETER PARLEY'S  
**PEDIA OF BOTANY,**



INCLUDING  
FAMILIAR DESCRIPTIONS OF  
**TREES, SHRUBS AND PLANTS;**  
WITH NUMEROUS ENGRAVINGS.

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BOSTON:  
WEEKS, JORDAN AND COMPANY.  
1838.

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## PREFACE.

THE purpose of this work is, to furnish to young persons, to families, and inquirers generally, a convenient book of reference on Botany, — one which may be practically useful, as well to the student who wishes to pursue the subject systematically, as to the casual reader or observer, who desires occasionally to consult some authority in relation to a particular point. To accomplish these ends, the work is divided into several parts, as follows :

1. The **INTRODUCTION**, which lays down the general principles of the science, and deserves an attentive perusal, particularly from those who wish to make themselves masters of the subject.

## 2. A GENERA OF PLANTS, showing their Classification.

3. A DICTIONARY OF PLANTS, containing descriptions under an alphabetical arrangement, of several thousands of the most interesting trees, plants, and shrubs, of all countries, with particular notices of the most

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remarkable vegetable productions of this portion of the American continent.

Beside these three principal divisions, the reader will notice in the table of contents, directions for the *Preserving of Plants*, and a *Glossary of Botanical Terms*. He will also observe, at page 326, an *Index of Common Names*, which may be found convenient. If the reader wishes to find the description of any plant of which he only knows the common name, he may find it in this Index, and that will refer him to the place where it is described.

It may be proper to add, that the Introductory part of the work has been compiled from various sources, and lays no claim to originality. The descriptive portion is the result of considerable research and some observation. From the writer's experience, in the pursuit of botanical knowledge, he feels justified in the belief that this little volume will prove practically useful, and will serve to extend the knowledge of this delightful branch of natural science. If it shall lure the youth of our country more frequently to the forest and the field, and teach them to look with deeper interest into their vegetable mysteries, — it will answer the chief design of the author.



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# INTRODUCTION.

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## CHAPTER I.

**BOTANY**, — the science of the vegetable kingdom, is one of the most attractive, most useful, and most extensive departments of human knowledge. It is, above every other, the science of beauty. There are few plants, which are not beautiful, considered as separate individuals, and in all the parts of their individual organization; and there is a beauty in the grouping of plants, whether as grouped by nature, or by skilful art, to which there is nothing equal in that of any of the other productions of nature. The landscape is the object which mankind most generally admire; and the landscape owes its principal, if not its only charms, to its vegetation. Rocks have, no doubt, their grandeur, and there is a beauty in running waters, and even in placid lakes; but, let the rock be naked of vegetation down to and around its base, and its grandeur is painful, — it seems a ruin. So also if the water is denuded of its meadows, its thickets, its groves, its shady trees, and its plants of humbler growth, it is no longer beautiful; for an expanse of water or a rolling torrent amid perfect sterility, makes the contemplation of that sterility more gloomy, from the feeling that this water, by being unproductive, is so much of the bounty of nature running to waste. It is needless, however, to expatiate on this part of the subject; for every one feels it more forcibly in the contemplation of nature itself, than it could be rendered by even the most labored description.

As little is it necessary to descant on the usefulness of the study of vegetables; for we have only to look around us, and observe how much of our food, our clothing, our furniture, our habitations, the implements of our work, and the instruments of all our enjoyment are derived from the vegetable kingdom, in order to see that it is this kingdom which is the grand foundation of all our arts, and one of the instruments by which man has been civilized and enabled to turn all the other productions of nature to whatever use he makes of them. For instance, there can be no civilization without fire, — indeed fire is one of the chief distinctions of man in the lowest states of society, from the other animals, many of which are superior to him in

strength, in speed, in the acuteness of their senses, and even in some of their artifices ; there can be no fire without fuel ; and all fuel is vegetable. It is by means of vegetables, — of the timber which forms the ship, and the fibres of which the cordage and sails are made, that man has been enabled to extend his knowledge to every portion of the globe, and partake at most points of its surface of the riches of all. No one can help admiring the exquisite beauty of many flowers, and the delicious flavor of many fruits, which are habitually brought from a distance of many thousand miles over the sea ; and for all of these, and for every foreign commodity, and for every piece of foreign information that we can enjoy or obtain, we are indebted to the vegetable ship.

A subject which is of so vast and varied usefulness, and which at the same time has so much of beauty to recommend it, cannot receive too much of our attention ; and the more to induce us to bestow this attention we find by experience, that the productions of the vegetable kingdom are much more obedient to skilful cultivation than those of any other department of nature. Compare an ordinary field under crop with a neglected common of precisely the same soil, and in a situation exactly similar, or compare a moderately cultivated garden with a neglected heath, and they appear as if they were not parts of the same country.

Take some of the most common but at the same time the most useful of those vegetables which we cultivate as food, and consider what human skill has done for them. Where is there a native grain like wheat, a native fruit like the apple, a native bud like the cauliflower, or a native root like the potato ? The last is a remarkable instance of what cultivation can do ; and its history from the wild plant happens to be known. The potato is a native of the mountains of tropical America, and when found wild there, it is barely, if at all eatable. These are but a few instances out of many in which plants, naturally of little value, have been rendered very valuable by cultivation, in climates much less favored by nature than those in which they are found native ; but even these may suffice to show the vast advantage which has been derived from studying the nature of vegetables ; and as the number of which the improvement by culture has been ascertained, is very small compared with those of which it has not, the field open for further improvement is as wide as it is inviting.

This improvement of the quality, and increase of the number of useful vegetables, useful to man, is the end or purpose of the study of botany. But the way to that end is long, and embraces much of interest, not only as regards the structure and economy of plants themselves ; but as regards the circumstances of place and time, under which they appear, and in consequence of which they put on those differences of appearance, which make this kingdom of nature so exceedingly diversified. There must, however, be a beginning ; and as the acquiring of knowledge which already exists, and which

has been put into a scientific form, is, in some respects, the reverse of the original discovery of this knowledge, the student naturally begins where those who formed the science ended; that is, he begins with the classification, which being a shortened index to the different species of plants, renders a general knowledge of the whole much more easily and speedily acquired than if the student were to begin with a single plant, and endeavour to find out what the circumstances are to which its distinguishing characters are owing.

The two most celebrated classifications, are the artificial one by Linnæus, and the natural one by Jussieu. The former will be found in the subsequent part of this volume. It is exceedingly simple, as it depends on a single character only, — that of the parts of fructification in the flower; but it has this disadvantage, that it conveys very little information respecting the general characters, habits, and uses of plants. The natural classification is more instructive; but it is necessarily imperfect, inasmuch as no complete natural system can be formed, without a knowledge of all the particulars of every plant, a result which of course has not been even approximated, and which, from the very nature of the case, can never be wholly arrived at. It is, however, more calculated to convey a knowledge of plants than the artificial system; because it contains more relations between plant and plant, and thus that which is known becomes an efficient instrument in the discovery of new truths.

But in addition to all those characters of plants which can enter into even the most elaborate natural system, there are many others which belong to the species, and which render the details very voluminous. These, however, are interesting parts of the study, because it is in them that we find those qualities which may be turned to use; and also all the numerous and curious methods in which the principle of vegetable life develops itself, and elaborates the different organs and qualities of which plants are composed. A good deal of definition is required on this part of the subject, in order to be able to distinguish the consistencies, forms, arrangements, and other peculiarities of the parts of plants, and also the circumstances which make the parts of the same species of plant different in some cases from what they are in others. This part of the subject applies not only to the composition, the texture, and the other properties of the plant, which are apparent to the senses viewing it as a production, for they apply equally to the mode of its production, and to the time and quantity of production, and to how either or both of these may be changed!

It requires no argument to prove that heat and moisture are the principal agents in the development and the subsequent growth of vegetables; but each of these agents is limited to a certain range, and this range is different in different plants, so that excessive heat and excessive cold, and also the extremes of drought and of humidity, are always unfavorable to vegetative

generally, though not to all kinds of vegetables. Thus some mosses and other plants, whose parts are few and little developed, continue to grow in very cold weather, and even under the snow; others, which generally contain much juice in their substance, but which are covered with an epidermis so compact that it resists the action of heat, and prevents any evaporation of the juice of the plant, live in situations where the heat is extreme, and during that part of the year when excessive drought renders the common vegetation as inactive as it is in polar countries during the depth of winter. Plants of the last description may be considered as adapted to the extreme both of heat and of drought; and they, as well as those which are adapted to the extreme of cold, are equally remarkable for slowness of growth and tenacity of life. It seems, indeed, to be a general law in the economy of the vegetable tribes, that those species which make the slowest progress, are the least subject to casualty; and this holds true also in the case of the seeds and the germ of plants, the large ones of which are frequently destroyed, while the small ones are much more indestructible.

Light is another element which has a powerful influence upon plants; and it is chiefly to its action that their colors and the firm textures of their substances are owing. It is generally understood that the chief action of light is the decomposition of carbonic acid, because, in the same species, plants which are fully exposed to the light always contain more carbon than those which are not. This subject is, however, both difficult and obscure, because of the different refrangibility of the different parts of the solar light, and the variety of angles at which, in consequence of difference of latitude and change of seasons, the beams of the sun fall upon the vegetation of the different parts of the earth's surface. There is some reason to suppose, however, that it is the deoxidizing portion of solar light, which is the grand agent in the coloring of vegetables. This portion of the light is the most refrangible, and therefore, it must be the greater in proportion to the whole action of light, in proportion as the light falls more perpendicularly upon the surface; and we find by actual observation that the colors of vegetables, especially of flowers, which are the most sensitive parts, are most brilliant near the equator; and that there is a gradual diminution of the beauty of flowers, from the equator towards the poles. We find also, that in those places which have considerable difference of seasons, the colors of the native plants, the only ones from which we can form a correct judgment, are pale and faint in the early part of the season, when the sunbeams come low and slanting; and that the colors become deeper as the season advances, and their brilliancy is at a maximum at the season at which the heat of the sun is greatest. It is impossible, however, to lay down any precise rule for the action of a single cause upon the vegetable world, because the whole of the agencies to which they are subjected act upon them jointly and at once, so that we know not how the one agency may modify the other, neither are we

able to say that there may not be many agencies at work in producing vegetable phenomena of which we are entirely ignorant.

Exposure to the atmosphere is another important element in vegetable action ; but it is exceedingly difficult to separate the simple fact of exposure from the influence of the kind of air to which the plant is exposed. When we say "kind of air," we do not mean that there is much change in the great constituent principles of the atmosphere, the relative proportions of these being everywhere nearly the same, but we refer to the density and temperature of the atmosphere, and also to the foreign substances that may be mixed with it. It is natural to suppose that under the same temperature, there must be more vegetable action in dense air, because such air offers a greater resistance, and this resistance will occasion a greater degree of heat by the action of the plant. For a similar reason, when the air is of equal density, that which is warmest will be productive of the greatest vegetable action. This action will, however, in both cases be modified by the moisture of the air, and also by its being still or in a state of motion. In order to understand this, we must bear in mind that the air is the medium of two distinct and even opposite actions in vegetables, independently of the influence that it may have upon the active parts of them, as a direct stimulant, or a means of resistance.

Humid air supplies some vegetables with all the nourishment which, from their situations, they can possibly obtain ; and therefore we may conclude that it is capable of affording some nourishment to every vegetable. But the air also acts as a drain upon vegetables, in removing out of their structure a portion, and sometimes a very large portion, of that water which is necessary for the purposes of growth ; and in proportion as the air is more humid, it must perform this function less perfectly. We must therefore suppose that there is a certain degree of moisture, and of evaporative power jointly, in the air, which is best adapted to the healthy action of plants ; but what this is, must depend upon the nature of the plant, and must therefore be ascertained by direct observation. Indeed, this is one of the circumstances which tends to the local distribution of the different kinds of plants, as we find them in a state of nature ; but, like the others, we cannot so separate it from coöperating causes, as to obtain the law of its action. There is one other circumstance connected with the air which is worthy of notice ; and that is, whether it be more generally stagnant or in motion. It is perfectly evident that the action of stagnant air upon a plant must be every way less than that of moving air, whether we suppose the action to be of one kind or another ; and therefore, up to a certain point, motion in the air must be favorable to the growth of vegetables. Of this there have been proofs by direct observation, in the same part of the world ; and when we examine different parts of the world, we find proofs which are much more striking ; thus for instance, the trade wind of the Atlantic sets constantly against the shores

of Brazil and Guiana, and up the valley of the Amazon, until its motion is gradually destroyed by the dense mass of vegetation over which it passes.

The Oriental isles, and the southern part of the Malay peninsula, are in like manner exposed to a constant current of the air; and those two regions are, in respect of the number, the variety, the beauty and the activity of their vegetable productions, the very gardens of the two hemispheres. Even when the current of air is an alternating one, the return of which is actually unfavorable to vegetation, such a situation is still highly favorable upon the whole. Of this we have striking examples in the valley of the Mississippi, the Malabar coast of India, and even in the British Islands, and, generally speaking, along the whole of the west coast of Europe, where the advantage is not counteracted by some local cause.

Elevation above the mean level of the earth's surface, exerts very considerable influence in determining both the kinds of plants, and the degree of their action. Generally speaking, the more elevated the station of the plant is, its action is the less, because the air is less dense, generally colder, and is understood to have greater evaporative power; but mountainous countries are generally much better supplied with humidity, than plains; and therefore, the dwarfed growth of plants in such situations must be considered, as resulting much more from their diminished action, than from any excess of evaporation. Hence, as we ascend the slopes of mountains, which are of sufficient elevation for having their summits covered with perpetual snow, we find upon them plants resembling those of a succession of latitudes, gradually getting colder than the mean temperature of that which answers to the level of the sea, in the same latitude as the mountain. So that, upon very lofty mountains near the equator, the Andes in Upper Peru for example, we meet with something resembling the succession of plants in the whole quadrant, from the equator to the pole. But it is a resemblance only, and not an identity; because, although it be possible to find upon the sides of such a mountain, places which have the same mean temperature for the year as is found in every parallel of latitude, yet both the daily and the seasonal distribution of the sun's action are very different: and it necessarily follows that the habits, and even the characters of the vegetables, are equally so.

The exposures which the situations of plants have upon mountains, exert a considerable influence upon their characters, and also in determining their species. This influence is occasioned by the modification of heat and light; and the result of it depends not a little upon the latitude, and also upon the local situation of the place. The northern sides of mountains, in the north hemisphere, or generally those which are turned away from the principal action of the sun, have, under the same circumstances, more moisture, but less both of heat and of light, than those sides which are turned towards the sun. Therefore, we may be prepared to expect a more exuberant vegetation on the north side, a greater production of vegetable matter as it were, but on



the south side a more elaborated, and more developed vegetation. The northern side of the mountain will in fact be richer in green vegetation; but the southern side will be more flowery. It is impossible, however, to lay down a rule here, just as it is in the other cases; because the exposure is only one of the many compound causes, and it will sometimes operate advantageously the one way, and sometimes the other way. Thus, if there be an excess of moisture over the whole of a mountain, the sunny side of it will be by far the most fertile; but if there be a deficiency of moisture, it will be the least so. Small patches of land inclosed by rocks, or by elevated banks, and exposed to the sun, are, for various reasons, much more favorable to vegetation, than the finest plains in the same latitude. They act as receptacles for all the finer particles of the soil, which are blown into them by the winds, or washed into them by the rains; they are generally situated at those places where the springs trickle out; and the elevations around them reflect the heat upon them. If such patches of soil are watered from springs deeply seated in the rock, they are both more rich and more nearly perennial in their vegetation, than if they are watered by surface rills, especially rills which descend from the snows. Those surface rills vary in temperature; and in the early part of the season they are cold, whereas water from deeply-seated springs preserves nearly the same degree of heat all the year round. There are many other circumstances, arising from the stations or small localities upon which plants grow; but these involve so many details, that each must be studied by itself.

The sub-soil, that is the rock, sand, gravel, or clay, or whatever may immediately support the mould in which the roots of plants act, and which, in a state of more or less minute division, generally mingles with the proper vegetable soil, is usually understood to exert a considerable influence on the action of plants, and by that means to be instrumental in determining their species; and it becomes necessary to consider the connexion which there is between the species and style of growth in plants, and the nature of this sub-soil, in order to understand their local distribution. But still, it is highly probable that this influence of the sub-soil is only secondary, at least in so far as what are called the simple earths, are concerned. Sub-soils which contain potass or soda, probably have some influence on the nature of the plants which they produce; because we find soda in the substance of those plants which grow on soils strongly impregnated with that alkali; and as there is potass in almost all plants, we may naturally suppose that the debris of rocks containing that alkali, will be favorable to vegetation. In general, however, we may regard the action of sub-soils as being secondary, and as influencing the plants through the medium of heat and humidity. If the sub-soil be retentive of water, but ready to receive it, and contains no metallic oxide, or other ingredient which can act as a poison to the plants, it will be favorable to the growth of the more deeply-rooted ones; while if the

sub-soil be free, or allows the water to descend below the reach of vegetation, the native plants will be much smaller in size, but more elaborated, more colored, and more pungent. This subject again, however, gets so much into detail, and varies so greatly even in places near to each other, that it cannot be generalized, though it is of great importance both in studying the habits of individual plants, and in turning both plants and soils to the best account in cultivation.

The influence of climate and of seasons must, however, be regarded as the principal cause of the local variations of the vegetable tribes; but climate is an exceedingly complicated matter, depending on elements which are very numerous, and some of them but ill understood; and seasons are so much dependent on climate, or rather on the various causes of climate, that it is impossible to do any thing more than very simply generalize this part of the subject; and even then, the generalization cannot be applied with perfect accuracy to any one place; and thus, when we attempt to collect the elements which would lead us to an understanding of how certain places of the world are covered with peculiar vegetation, all that we can arrive at is an approximation, or rather a guess at the leading principles which enter into the question, without being able to state their relative effects, which vary for almost every place, both in latitude and in longitude. Even the *isothermal* lines, or lines of equal mean annual temperature, though accurately taken, and that is difficult if not impossible, are of much less use in determining the geographical distribution of plants than we would at first sight be apt to suppose; for though there is some connexion between these isothermal lines and the distribution of vegetables, yet heat is but one of the many elements which determine the kind and degree of vegetation for any place; and we are never able to tell what proportion its effect bears to that of the other elements.

The daily and seasonal action of the sun, as dependent upon latitude, is however the grand, or at all events the primary, cause of the difference of vegetable production in different regions; and though it is much modified by those circumstances which have been previously stated, it is never altogether destroyed. If we take the medium of the year, we have the influence of the sun, as regards the action both of heat and of light, greatest at the equator, where the sun is perpendicular, and diminishing to its smallest amount at the poles. This minimum is not, however, equal even at the poles; first, because the refraction of the atmosphere bends the rays of the sun downward to the surface of the centre, and secondly, because, in the rotation of the earth on its axis, the polar regions are carried much more slowly through the solar light, than the regions of the equator. Upon these principles mathematical theories for mean temperature in different latitudes have been formed, but they do not agree with observation. A little increase of hea

towards the poles must also be occasioned by the flattening of the curvature there, and the surface being in consequence a little nearer the centre of gravity. This will cause a slight condensation of the atmosphere and a consequent giving out of heat to the earth.

The daily variation of temperature must also be taken into the account; and although this is not uniform during the year at the equator, it is upon the whole greater there than in any other latitude. There is always about twelve hours of sunshine, and nearly the same length of darkness; and when the air is clear the action of the sun is generally sufficient to occasion a suspension of the action of many vegetables, or what is sometimes called a sleep of plants, during the heat of the day. But, unless for local circumstances, the chief of which are alternate successions of drought and rain, there is nothing in the mere solar action which can affect vegetation there very much more at one time of the year than at another; and therefore, considered with reference to the sun alone, the vegetation there is not only generally ever-green, but ever-growing, ever flowering, and ever-ripe and in fruit.

In the extremes of latitude again, a portion of one half of the year is continual day, and a corresponding portion of the other half continual night; and when the continual day approaches, if part of the heat of the sun were not occupied in melting snow and ice, and turning into vapor the waters which clouds the atmosphere and mitigates the ardor of the solar heat, the action of the sun in those high latitudes would at these times be excessive. As it is, vegetation, during the short period that it acts, is more vigorous in such parts of the polar countries as are out of the range of the cold produced by melting snow or ice, than it is in any other part of the world; and, even in Lapland, we have that expansion of the bud, the blowing of the flower, the ripening of the fruit, and the preparation of the new bud, in little more than half the time in which these operations take place in the temperate climates. This state of things requires a corresponding vegetation, — a vegetation which shall be enabled to resist equally the ardor of summer and the rigor of winter. For this purpose, such vegetables as stand exposed to the air at both seasons, form complete buds, incased in a hybernaculum, composed of a number of scales of a resinous or gummy consistency, with thin strata of dry air between them; and buds so shielded are proof against the utmost severity of cold. The more lowly plants of such places are defended by the snow which covers the ground, and thus though the action of the vegetable world is limited in its annual period, and also in the number of species in which it is displayed, it is as perfect in its system and as secure in its continuance as in the tropical regions. Between these extremes, there is a regular gradation; and taking that, and local observation along with us, we are in possession of at least the elements upon which a geography of plants may be formed. To give, however a concise view of the different grades of vegetation in every zone of the earth, as described and classified

by botanists, is the purpose of the following pages; and although physiological and systematic botany be the chief features, pretty clear ideas may also be acquired of the geographical distribution of plants.

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## CHAPTER II.

### DESCRIPTION OF THE VARIOUS PARTS OF PLANTS.

**BOTANY** is that science which includes the study and investigation of the vegetable kingdom. To describe and enumerate plants, to give them their proper names, to mark their habits, physical differences and qualities, to arrange them into divisions by their organic structures, into tribes by their most ostensible characters, into families by their affinities and essential synonyms, and each individual of the families by its specific distinctions, is the business of the practical botanist.

In presenting to the reader a general view of this interesting portion of natural history, it will be necessary, before treating of systematic botany, to describe the physical members of plants, that is, those different parts or organs which compose the vegetable frame, their apparent uses or functions, the character of their various membranes, their duration, decay, and reproduction, together with the nature and motion of the sap.

Before proceeding with a description of the various members of a plant, it is in the first place necessary to convey some idea of the membranes of which they are composed.

#### VEGETABLE MEMBRANE.

**THIS** is one of the results of Almighty creative power, which, by the concentration or union of pre-created elements, called into form every plant whose seed or power of extension is in itself. This membrane is composed of innumerable distinct vesicles, variously arranged with respect to each other; each having a thin pellucid elastic integument, originally uninflated and inconceivably minute, but capable of being distended to a limited size, but in a definite order incident to the plant to which they belong, and in any direction. Leaning closely on each other, the cells are pressed into the various figures of spheres, spheroids, elongated cubes or ovals, forming the specific organic structure. There are also intercellular spaces which serve for the conduction of fluids or depositories of the secretions of the plant.

Fig. 1.



Fig. 2.

Of this membrane every part of the vegetable is formed ; it being capable of extension into filaments and fibres, as represented in fig. 1 ; spread out into tissues, as in fig. 2 ; depressed into horizontal layers, as in fig. 3 ; compressed into perpendicular partitions ; or disposed in regular columns. When it is uniform in consistence and arrangement it is called *cellular* ; when varied by being disposed in tubes, fibrous bundles, or other organic forms, it is said to be *vascular*.

Fig. 3.



In describing a plant it is usual to begin with the root ; but as a seed or some dissevered part of a plant must exist before roots can be produced, it may be as well to begin with the description of a seed, because from it springs every other member which we shall have occasion to notice in the sequel.

#### OF THE SEEDS OF DICOTYLEDONOUS AND MONOCOTYLEDONOUS PLANTS.

**SEEDS** are the oviparous offspring of plants. They are discharged spontaneously from the parent in a dormant state, except in some few instances which will be adverted to hereafter ; but, with these exceptions, they may remain for ages uninjured. They contain a vital principle or embryo, which, when developed under favorable circumstances, is in all respects like the parent, unless art has interfered to change its form or qualities. When seeds are ripe they are shed from the capsules or from the other parts to which they were umbilically attached, and are then covered with one, two, or three integuments to preserve them till the season arrives, when other favorable circumstances conspire to produce germination.

A perfect seed is one of the most wonderful productions in nature ! It

contains a living principle within an organized body of cellular membrane capable of indefinite expansion. An acorn has been said to comprise the rudiments of every member of the largest oak. When placed in the soil,



Germination of  
Barley.

Germination of  
Wheat.

Development of  
perennial Gramineæ.

the fluids within are excited into fermentative action by the impact of heat, air, and moisture, in due degrees. Expansion of the membranes takes place, the outer coverings are burst asunder, the roset of the awakened plantlet escapes away from dry air and light, descends in search of humid and gaseous elemental food, and fixes itself in the earth. Soon after the apex of the ascending axis shoots upward, pierces the surface, and expands in the air.

The vital embryo is attached to one or two lobes of nutritive matter, destined to yield sustenance to the infant plant while it is establishing itself in the ground. In doing this office these reservoirs of nutrition either remain undeveloped in a shell, as the cocoa-nut, within the surface of the ground, as the common bean, or are raised with and upon the ascending stem, as exemplified in the cucumber, the garden balsam, &c. ; when thus developed they receive the name of seed-leaves (*cotyledons*).

The general form of seeds is ovular or kidney-shaped ; some remarkably compressed, others depressed, varying in size from an inch or more in diameter to an atom hardly perceivable by the naked eye. Some are provided with appendages for defence, others with spiral awns, or little hooks, or wings, to assist their dispersion. All are enclosed in a thin film of cellular tissue; and this protected by a covering of chaff, by a woody shell, or by a membranous or leathery coat of dense cellular matter. These again are frequently contained in pulpy, fleshy, rigid vascular husks. When dis-

charged from these integuments they are of many different colors, as black, or white, or brown of various shades, purple, and some are beautifully scarlet, and used as ornaments. Almost all naked seeds have a mark or scar (*hilum*), sometimes prominent or depressed on the exterior, showing where they were attached to the seed-vessel or to its partitions (*dissepiments*), or to the receptacle of the seeds.

Although seeds, in all cases, are the real offspring or progeny of plants intended for the perpetuation of the species, and in this sense may be called also the fruit of plants, yet botanists have made a distinction between seed and fruit, and not without reason, because the latter is only the exterior covering of the former. The mark of distinction is this: whenever a stigma, or remains of its style, appears on the exterior of any production succeeding the flower, it is a fruit; but if no such mark or remains of a faded style be visible, it is a seed. By this rule, the common orchard apple, with the visible remains of the flower at the top, and the dry leathery capsule of the poppy, with its permanent stigma, on its apex, are both fruits; so the long husky pod of the common broad bean, and the delicately beautiful pendent globes of the cherry-tree, are equally fruits. The very large and very small seeds of the second and third of these plants present no such exterior mark or appendage at all similar.

## OF ACOTYLEDONOUS PLANTS.

ACOTYLEDONOUS plants are those in which the seed lobes are either absent or indistinct. They have no seminal leaves, and consequently the structure or organization of their seeds (*sporules*) are very different from those already mentioned. Instead of the resemblance to an egg, having an embryo enclosed by, or surrounded with, farinaceous or albugineous envelopes, as in the dicotyledonous plants, they rather appear to be viviparous particles separated from the mother plant, exerting roots or shoots indifferently from any and every part of them. They correspond pretty nearly in their extent to the imperfect plants of Ray, the cryptogamous plants of Linnæus, or the agamous plants of Humboldt. Hence it will be seen that they embrace merely the lower grades of the vegetable creation — the Filices, the Musci, the Hepaticæ, the Algæ, the Fungi — being placed, as it were, at the bottom of the scale, and exhibiting, in their outward aspect, as well as in their internal structure, nothing of that loveliness of form, and but rarely that brilliancy of coloring, by which some of the other divisions of plants are distinguished. They are the first and rudest types of vegetable life, many of them consisting merely of a cluster of minute cells, or of minute threads, as in the case of *proto-coccus* and *byssus*; and many of them being, in fact, nothing more than a mere slime or mucus, as in the moulds and nostocs. Yet these minute and apparently insignificant tribes of vegetables are by no means useless or superfluous in the scale of nature. They are just what

they should be to complete or keep up the integrity of the vegetable kingdom, whether it be by decomposing putrid and fecal matters, or by preparing a soil fit for vegetables of a higher order. They are scattered over all climates and all quarters of the world, replenishing both earth and sea with vegetable life, and ascending even into the regions of the air, by the very lightness of their seeds or germs, to be wafted on the wind, till drenched with moisture they descend again, ready to cling to the soil that suits them, if it should be even the surface of the flinty rock, or to spread themselves over mountains of eternal snow, or to immerse themselves in the waters of the ocean. Thus many of the algae, at least, sow their seed and germinate where no other plant could live. They grow up, and come to maturity, and perish where they grow, forming, in the process of years, a soil of some depth. First mosses, and then ferns, are found to follow in their train, leaving a soil deeper and richer still, till at last, in the revolution of ages, the very surface of the barren rock is covered with a soil capable of supporting the loftiest trees.

#### OF THE ROOT.

A root is first an undivided spur-like body, descending directly into the earth, either attracted by its moisture or solidity, or averted from dry air and light. The extreme point of a radicle is elongated chiefly by the protrusion of its centre, and in some degree by an increasing of its length, the exterior cuticle being left behind, while the internal part is momentarily progressing forward; the point itself being extremely delicate, would be instantly checked or withered if exposed to dry air. This constitutional delicacy may account for the prone direction of roots in the first place, or at the first setting off; because, as soon as they have gained a certain depth, they proceed laterally as readily as they descend. Indeed, a certain degree of influence of the air seems to be necessary to them: as the roots of some trees take a very extensive horizontal range, keeping at a very regular depth from the surface, however unequal this may be, even from one side of a ditch to the other, without varying much in distance from the air.

As soon as the first spur-like root issuing from a seed enters the soil, it emits small fibres from its point and along its sides; some of these become branches, which, in their turn, also eject fibres along their whole length; these are again divided and subdivided, until the whole system of roots is formed, and thus they continue annually extending as they are prompted by the demands of the head. The roots and head of the plant are *correlative*, and are always naturally proportioned to each other. No extension of the one can possibly take place without a corresponding extension and enlargement of the other.

The fibres (*spongioles*) are the real roots or mouths of the plant, by which they imbibe or extract nourishment from the earth; for, though it be perfectly



reasonable to suppose that the spongy bark of the larger ramifications also imbibe alimentary matter, yet to the working fibres is the system chiefly indebted for the principal share of the nourishment required. These delicate bodies are beautifully organized, and well fitted to take up those gaseous and aqueous elements necessary to the plant; their syphon-like form, beset with hair-like appendices, enter into every cavity and interstice of the soil in search of food, which these convey into the body of the root; and it is observable, that they are more or less numerous according as the plant is more or less vigorous. In water, or in finely comminuted soil, they are much divided, and are ejected like tufts of hair from the ends of the principal divisions of the root.

Fibres can only be produced in the earth or water, or in any other humid medium. Proper roots are often produced in the air, as may be seen on the cherry-tree, the grape-vine, and many other plants, when placed in damp or shady situations. The Indian fig, or banyan tree, is celebrated on account of its tendency to produce and throw down roots from its branches, which, fixing in the ground, become stems to support a new birth of branches which rise from that part of the branch whence the root has descended. Such roots, however, produce no fibres, because, as before observed, they are too delicate to be exerted in dry air.

There is no question but that these roots, though destitute of spongioles, have the power of inhaling through their vascular bark those qualities floating in the air which are adapted to, and necessary for, the amplification of the plant.

Although the roots of a great majority of plants are produced below the collet, or base of the stem, they may also be produced from almost every part of the stem or branches, sometimes naturally, as above alluded to, or accidentally, as in the case of a fallen tree, or by art, as takes place in propagating by cuttings and layers. Of roots there are many modifications, differing chiefly in form, and probably in their manner of acting as recipients of food. Bulbous-stemmed plants have generally fleshy roots, with but



Root of the Peony.

few fibres, acting in the earth as the air-plants and other fibreless roots do in the air, viz., by absorption through the pores of the cuticle.

Some plants, as the peony, have, besides fibres, large fleshy appendages, which not only serve to fix them in the ground, but serve as reservoirs of moisture during severe drought. It seems to be a general law of nature, that all plants assailable by drought are furnished with bulbous or tuberous stems, or appendages to enable them to resist its effects.

In botanical books, roots are designated by proper names, viz., bulbous, of which there are three, — the scaly, the coated, and the solid; to which are added the duplicate, the articulate, and the caulinar. There are also tuberous roots distinguished from each other by their form, or by the manner of their connexion, namely the globular, the truncated, the spindle-shaped, the handed, the bundled, the twinned, beaded, and several others, as in the three following cuts. The writers who first proposed such

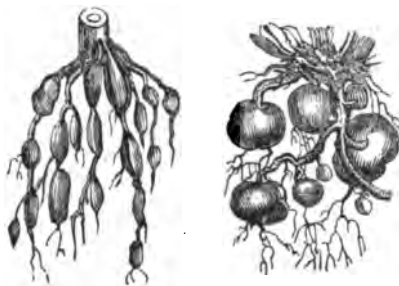


Spindle-shaped and truncated under-ground stems or roots.

distinctions, evidently meant nothing further than that part of the plant usually found in, or resting on the ground is the root; because an onion or a potato can no more be called the root than any other part of the stem which happens to be elevated in the air. The proper functions of a root are to draw nourishment from and fix the plant in the earth, neither of which is performed by bulbs and tubers without the assistance of real roots put forth from the body of the bulb or tuber, or from a member quite distinct from what is called a bulb or tuber.

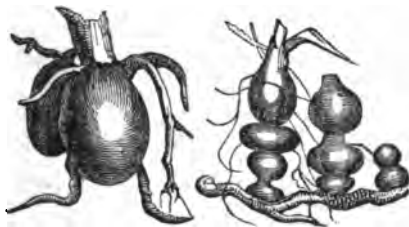
With regard to the permanency of roots, they partake of the character of the plant to which they belong. Those of annuals die with the plant at the end of summer. The main roots of trees and shrubs are as lasting as the stem and branches; but the fibres produced upon them are more fugitive, in many cases dying at the end of the growing season, and renewed in the following autumn or spring. This is very apparent in the case of bulbs and many tubers; and it is worthy of remark, that there is much agreement in

the times of appearance and disappearance of the leaves on the branches of a tree, shrub, or herbaceous plant, and the fibres on the roots; they are produced simultaneously and fall off together.



Bundled and granulated roots.

Compound plants, that is, such as perennial herbs and some sorts of shrubs, being formed of many divisions, have not a common root; each division has its own roots, and may be slipped off without injury. Every new addition of shoots or leaves is produced by a new set of working fibres.



Twinned and bearded roots.

Some parasitical plants, as the missletoe, have no visible fibres; their attachment to the plant they live on, seems to be a union of the cellular membranes of both. Others, as many of the tropical orchideæ, appear to use the stems of trees as supports, but without extracting from them any aliment whatever.

The foregoing observations are intended to identify what are really roots from other parts with which they are sometimes confounded. Under-ground stems are often called roots; such as those of couch-grass, the potato, and other plants which increase themselves by under-ground runners.

The structure of roots is very similar, whether succulent or woody. The latter have a central member, formed of longitudinal fibres bedded in cellular and vascular matter, but without any pith. This central body is increased by annual additions to its exterior, in the same manner as the woody axis of a tree is increased. It is also covered with various layers of cuticle or bark; but which are always thinner, softer, and more spongy than that which is exposed to the air. The roots of some trees, as the elm and white poplar for instance, appear to have the same structure (except in being pithless) as the stems, and moreover are also furnished with buds, which shoot and form suckers all round, and at considerable distances from the trunk.

Roots of trees are more durable than their heads; and this, perhaps, because they are less exposed to the vicissitudes of weather. Although they generally die soon after the stem is cut over, yet there are many exceptions, as in the case of the two kinds just mentioned; and there are some remarkable circumstances on record relative to the longevity of roots. It is well authenticated that the roots of a mulberry tree when grubbed up, were found fresh and sound, though the tree had been felled forty years before! And from what has been lately observed by an eminent French botanist, the roots of the silver fir not only live for several years after the butt is dis severed, but actually increase in bulk: thus showing that the vital membrane, or that layer which is always seated between the bark and the wood, retains the power of enlarging itself, although there are no shoots to excite it into action, or outlet save its own expansion.

The principal roots of trees are enlarged and extended in proportion to the growth and expansion of the stem and branched head. They are ever ranging, and further from their first station in quest of fresh pasture, as it may be called, or of soil which has not been already exhausted of those qualities which are necessary for the amplification and support of the system. And, therefore, it is that, when desirable to assist the growth of a tree by manure, it is of less service if laid close around the stem, or trunk, than if laid at some distance; that is, in a circle where the points of the roots may be supposed to have reached. This distance is always equal, at least, to the extent of the branches; these and the roots generally keeping pace with each other in diverging from the first station of the tree. In many cases, indeed, the roots extend to a much greater distance than the branches; those of the white poplar already alluded to, run out to the distance of two hundred feet.

Attending to the development of a seedling plant, we cannot fail to observe that there is a point between the descending and ascending members

which seems peculiarly organized. Whatever enlargement or ramification of the axis takes place in the first stage of the life, below this point, are roots, and descend; and whatever is above, are shoots, and rise into the air. This point bears the cotyledons, or seed-leaves; it is the crown of the roots and the base of the stem. In bulbs it is called the radical plate, fig. 4; of herbaceous plants, fig. 5 and 6; and of trees and shrubs it is called the life-knot, or collet, fig. 7.

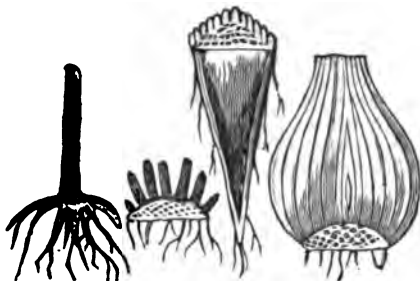


Fig. 4. Fig. 5. Fig. 6. Fig. 7.  
Sections of different Plants, to show the Collet.

This member is constitutionally of the greatest importance in the system; all the other members of the plant may be destroyed or separated, without risk of killing the plant, if the collet only be preserved. In some cases it may be divided into many parts, each of which will become perfect plants. Every scale of the bulbs of the common white and orange lilies, if pulled off with ever so small a portion of the radical plate attached, will each, if placed in the ground, become entire plants. In all bulbs, many tubers, and all other herbaceous plants which have not under-ground stems, the radical plate or crown is the centre of vitality, from whence all accretion, whether of roots, stems or leaves, proceed. All the productions of former years arise from it, and have withered away; and all that shall be produced must spring from that slender body, — the radical plate of a hyacinth or tulip bulb.

If we examine this wonderful member we find it a homogeneous, solid substance; not granulous as we may suspect it to be, like the ovium of an animal; but from its power or property of throwing off an endless train of perfect individual plants, we must consider it to be an aggregation of vital gems which are developed in the order of their position. The most central bud or gem generally takes the lead; but if this be damaged or checked by accident, or if it cannot appropriate the whole of the vigor derived at any one time from the roots, the next gem in order will be advanced, and perhaps

one, two, or three of the lateral gems will be ejected ; these, when they do so appear, are called off-sets. In every year of the existence of a bulb we see the radical plate produce new roots, leaves, flowers, and seeds, all of which, when the last are ripe, fall off, and are for ever separated from the mother plant. A successor in the mean time comes forth, occupies the space of the former, and is matured by the summer heat to be fully developed in the following year. In this way is the plant perennial, from its principal member being a source whence flows in infinite succession its annual products ; and so it continues to do, as long as the plant remains in a sound and healthy state. Herbaceous plants in general not only produce an annual growth of leaves, flowers, and seeds, but also viviparous progeny parted off from the edges of the crown, which however is not thereby diminished, as is the case with the narcissus. Others, when they are surrounded by numerous offsets, die off, leaving the space to be occupied by their offspring : of this description is the strawberry.

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## CHAPTER III.

### OF THE STEM OR TRUNK OF PLANTS.

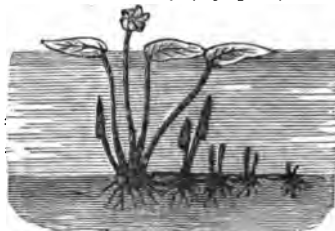
THE stem or axis of a plant is that columnar body, which, if above ground, serves to support and elevate the fructification. It assumes many forms and characters, as to bulk, structure, position, place, and duration. It ap



pears as a tuber, a bulb, a scape, a culm, or as a woody column. It varies in size from that of a bristle to a trunk of many feet in diameter. In structure, stems are hollow or solid, jointed or simple, single or numerous. In position they are erect, inclining, prostrate or involving. They rise in the air, creep on the surface, or enter deep into the ground. They are succulent or woody: if the former, they are quickly perishable; if the latter, they are more or less durable.

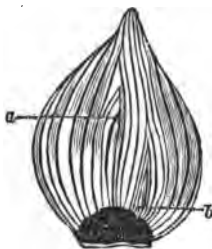
Tuberous stems are exemplified in the iris and potato. The first is a stem, branched or single, partly beneath the surface of the ground, from which the real roots are ejected; and partly above the ground, the top bearing the leaves and flower stem. The second is a plant which, whether propagated from seeds or cuttings, has a system of fibrous roots on which the whole depends for support. The plant produces stems of two descriptions, one in the air which bears the foliage, flowers, and fruit: others in the ground, which, when they have shot a few inches from the root, instead of being lengthened out, stop — the point swells, and becomes a tuber of a larger or smaller size, according to the richness of the soil, or variety cultivated. When the seeds are ripe the whole plant dies, leaving the oviparous progeny perfected in the air, and viviparous offspring matured in the earth, to perpetuate the species. The tuber has a large farinaceous pith, covered with a thick coat of the like substance, and a thin exterior cuticle. Those integuments are studded with groups of buds or eyes, independent of each other, over the whole surface, and particularly at the point or crown. Each of these groups, when dissevered with a portion of tuber attached, become perfect plants, and again in their turn produce other seeds and tubers. A plant with such powers of reproduction, and in its native climate, must soon usurp the surface of the surrounding country, did not their numbers, by diminishing and robbing each other, confine them to very limited spaces.

There are many other plants similarly constituted, that is, such as produce stems in the ground, as well as in the air. Of these may be mentioned the Jerusalem artichoke (*Helianthus tuberosus*); the field bindweed (*Convolvulus arvensis*). There are also aquatic plants, the principal stems of which are extended in the mud, as the water lily (*Nymphaea*).



An aquatic plant extending its stems in the mud.

It is worthy of remark here, that plants which have the property of increasing themselves by both seeds and offsets, produce the one in greater abundance, where means have been taken to prevent an increase in the other. Thus, for instance, the potato denied its purpose of producing seeds by being deprived of its flowers, the tubers in the ground will be much increased, as well in size as in numbers. On the other hand, if the young tubers be removed from the plant as soon as they are formed, and none allowed to be perfected, the numbers of flowers and seed will be greatly increased. So, rare or curious bulbs, which yield flowers, but do not ripen seeds in a climate foreign to them, may be forced to produce offsets by denying them the means of flowering, that is, by cutting off the upper half of the bulb.



Section of a tulip bulb in autumn — *a*, the flower of the following spring; *b*, the succeeding division of the bulb, which is perfected during the summer.

A bulbous stem has the collet for a base whence the roots are produced; on the upper disk of the collet the leaves are seated, involving each other round the centre, the exterior ones incrassated, abbreviated, and remaining for a longer or shorter period of time as a defence to the fructification before its expansion. The roots, leaves, stalk, flower and seed produced in this year are all deciduous, and fall off to be succeeded by the next division of the system, which will be developed in the next. As an example we may take the tulip, figured above.

In other bulbs, as the hyacinth, polyanthus, narcissus, there are always two or more divisions of the bulb coming forward together in different stages of their progress towards flowering: consequently these bulbs are always larger than those of tulips, or others of more simple character.

The internal structure of the bulbous stems is different, according as the leaves of the plant are placed with regard to each other. This may be rendered evident, by making a transverse section of the bulb: the outermost leaf partly or wholly embraces all the innermost, one of the edges overlapping



the other, but without adhering, as in the leek ; the onion having fistular leaves, the coats of the bulbs are entire. This description of bulb is said to



Transverse section of the onion, a tunicated bulb.

be coated (*tunicatus*). Another difference of structure is exemplified in the common white lily and other liliaceous plants ; the exterior of the bulbous body being composed of thick fleshy scales attached to the radical plate : hence these are called scaly bulbs (*Squamosus*). A solid bulb has also been



A scaly bulb.

described in old books, and the tulip has been pointed to as an example, but this is an error : the tulip is a coated bulb : nor has there been any bulb of that description yet discovered.

A scape is a stem which springs immediately from the radical plate of a bulb, as the daffodil, or from the crown of an herb, as the primrose.

A culm is a hollow stem, either jointed, as most of the grasses, or simple, as some of the rushes.

The above enumerated stems are mostly succulent, and either hollow, or filled with a soft cellular pith, the exterior being formed of a fibrous cylinder, charged with parenchymous and vascular tissue, and covered with a thin transparent cuticle. The greater number rise erectly in the air or water; some creep along the surface of, and others enter deeply into the ground.

A ligneous or woody stem supports the branched heads of shrubs and trees, and is composed of three principal parts, viz. the pith, the wood, and the bark.

#### OF THE PITH.

This member occupies the centre of the stem, and constitutes the principal part of the bulk of the seedling, and of every young shoot. It is more or less filled with a spongy matter, easily permeable by fluids. There seems to be no action in the pith, except as a duct, after the first year; for, as it increases in age, it decreases in volume, and in old trees becomes almost obliterated.

#### OF THE WOOD.

The first layer of this principal member of a stem is simultaneously produced with the pith which it surrounds. During its growth it appears in three different states; at first, it is like thin colorless jelly, in which state it is called *cambium*; next, it gains a subsistence like gum, showing faint signs of organization; and lastly, as perfect wood, called *alburnum*, having all the fibrous structure, cells, tubes, and consistence of timber. In this manner the diameter of all dicotyledonous stems are annually enlarged by concentric layers, the pith being in the centre of the whole. These layers of wood are composed of a mass of ligneous fibres, closely and longitudinally arranged, extending from the collet or base to the summit of the trunk, and to that of every branch of the spreading head. The fibres are imbedded in dense cellular matter, the cells of which are placed horizontally between the bundles, and, being distended in the line of their position, give thickness to the alburnous layer.

As these layers are perfectly distinct from each other, there being no fibrous interjunction, but merely cemented together by cellular matter and concreted sap, it is necessary there should be some common tie by which the whole column of concentric layers should be held together. This is accomplished by the convergent partitions of dense cellular matter, which reach from the bark to the pith in right lines through each layer. These perpendicular partitions are called "silver grain," and are those wavy lines so visible on oak timber when cut into pannels.

The number of the layers, reckoning from the pith to the bark, on one side of a transverse section of the butt or trunk, indicates the age of the tree

exactly ; for the layers never run into each other, nor do they increase or diminish after they are once imposed.

After the tree has passed its mature age, it at last begins to decay ; the first imposed layers next the pith fail first ; and this decay at the heart extends outwardly, till the trunk becomes a hollow cylinder, when the whole is laid prostrate by the wind. This happens sooner or later, according to the durability of the timber. Some kinds, from the light porous character of the wood, and aqueous quality of the sap, perish in a few years ; others, from the density of the grain, and preservative quality of its concreted juices, resist decay for many years.

## OF THE BARK.

The seedling rises from the ground with its coat of bark, consisting of a layer of green parenchymous matter, covered by a thin cuticle. This ever remains on the exterior of the greater number of trees, and is distended as the internal growth increases. Some few trees and shrubs discharge their bark every third or fourth year, but on the greater number the outer bark remains, and is either rent into longitudinal irregular furrows, or stretched horizontally. At the end of the second year, the second layer of bark within the first becomes visible, and takes the name of *liber*, a new layer of liber being formed within the former in every year during the life of the tree. The diameter of the tree is thus increased by a new layer of alburnum, or white wood, and a new layer of liber ; of course they are always equal in number to each other. The liber, however, of many trees, is so thin, and of so open a fabric, that the layers cannot, without maceration, be easily separated from each other ; but others, as those of the lime-tree, are so entire and tenaceous, that they are easily separable, and woven into Russia mats.

The new layers of wood and bark are the principal channels for the motions of the sap, it being always more copious in those members than in any other. Whatever the qualities of the sap of any tree may be, we generally find them more powerful and in greater quantity in the bark than in the wood ; hence the many purposes to which bark is employed in medicine and in the arts.

The stems or trunks of monocotyledonous plants are very differently formed. Instead of additional layers of new matter being deposited on the outside (*Exogene*), the new accretion is formed, and proceeds from within (*Endogene*). This manner of growth is exemplified in the palms and other plants belonging to the same class, but the most familiar instance is that of the common asparagus. In this plant it will be observed (if we consider one division of it) that it has a system of thick fleshy roots, fringed with fibres, proceeding from the collet, or crown. From the centre of the latter the



The roots of asparagus, showing the manner of increase.

stem takes its rise, and is almost as large on its first appearance above ground as it is ever afterwards. Its development is evidently an elongation of its previously existing organization, and surely not consolidated by any fibrous processes, which, during growth, descend from the branched head.

The stems of all the other orders of monocotyledonæ are similar in their development. Whether we examine the peduncles of bulbs, the stems of the *iridææ* and *musacææ* or the culms of the *gramineææ*, we find they all gain elevation by an elongating process, and by the simple distension and subdivision of the cellular and vascular apparatus, without addition of any new matter save the incremental elements which they extract from the earth and atmosphere. Here it may be necessary to premise, that in considering or investigating vegetable structure in general, we should always distinguish the mere distension of the cellular and vascular fabric of plants from their elements. The former are rudimental, the latter accessory; the first pre-exist before enlargement, the last are imbibed during, and to assist enlargement.

The development of other monocotyledonous plants may be noticed here. There are two very remarkable constitutional differences; in some the fructification is terminal, that is, placed on the point of a central stem; but in the greater number the fructification is lateral, that is, issuing from the axis of the leaves. Of the first description is the common American aloe, which is constituted of roots, a certain number of leaves seated on the collet, and which are developed *seriatim* from the circumference to the centre, the last involving the fructification, which, when produced, and the seeds ripe, the whole dies. The second description comprises most of the palms; the evolution of these begins by the expansion of the first exterior leaf, which is usually the least of all that follows; a second succeeds, with all the rest in train, until all are expanded, or so long as the plant retains vigor to bring them forth. The petioles, or foot-stalks of the leaves or fronds, as they are called, remain attached to the collet, and in time acquire a woody consistence, and aggregately compose what afterwards becomes the stem. This is conspicuously the case in the genus *Zamia*, and in all the dwarf palms,

which though they continue to evolve fronds and flowers, never show any great elongation of their axis. In the case of the lofty-growing palms, the first evolution of their radical leaves is similar to the dwarfs; but with the consecutive development of their leaves, an elongation of the axis commences, and continues rising to the height of sixty feet or more. This



*Agave Americana.*

altitude is gained slowly, the exterior of the stem being formed by the persisting bases of the leaves, and being connected with each other within, and with the collet, whence they all spring, form the stem. Thus it appears that the fronds are only expanded portions of the stem, the whole being one

uniform body of longitudinal fibres, imbedded in coarse cellular matter hardening, and becoming more compact by age. On a cross section, there appear no consecutive layers or divisions of the structure to indicate periodical additions, like those of exogenous stems, and may be described as the common petiole of the foliage and flowers.

#### OF BRANCHES.

These are only subdivisions of the trunk, being quite similar in structure. They differ much in the manner of their divergence: being mostly irregular, and spreading obliquely forward. Others, as the pine tribe, are regularly branched from bottom to the top in annual growths; the stem rising erect, and the branches stretching out horizontally in every direction; when branches are so disposed they are said to be *verticillate*. In some cases the branching is regularly alternate; in others produced in opposite pairs, alternately crossing, in which position they are said to be *decussated*. The branching of trees constitutes their chief beauty: the lower and lateral ones are mostly inclined to droop at the extremities, and which in many sorts is most graceful. The pendent spray of the weeping willow, birch, and ash trees, are universally admired, being much more beautiful than the stiff and formal form of the Lombardy poplar.

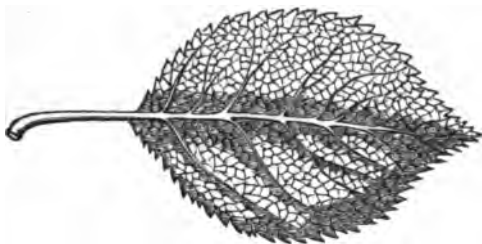
#### OF THE LEAVES.

The foliar expansions of plants are of several descriptions. The first to be noticed, are the scales or winter coverings of the buds, hence called *hybernacula*. They consist of dry membranous scales seated at the base of the bud, over which they are imbricated, and mostly deciduous when the bud bursts. They are in some instances covered with thick down; in others with gum, as the balsam poplar, or with resin, as in most of the order *Conifere*. Without such a provision as this, all the buds of trees and shrubs in the regions of frost would be destroyed; but such is the protection afforded by *hybernacula*, that they can bear thirty degrees of frost without injury.

The proper leaves are the grand ornaments of plants; from their numbers, position, and delicacy of organization, they are destined to effect some important office in the economy of the plant. They are, however, only temporary organs, being articulated with the surface of the bark, and always seated upon or near the buds. Those of deciduous trees or shrubs drop or wither as soon as the summer growth is over. Some of both of those descriptions retain their leaves to the second or third year, hence they are called ever-green; and some of the pines and firs retain them for many years.

Leaves are generally furnished with a foot-stalk (*petiole*), though sometimes this member is wanting, in which case they are said to be sitting (*sessile*). The foot-stalk is either short or very long; somewhat grooved on the upper

side, and convex below; it is produced into the web or disk of the leaf, where it forms the mid-rib (*costa*), whence branches like veins are sent off,



Dicotyledonous leaf.

traversing the whole disk. This disposition, and lateral branching of the mid-rib only, obtains in dicotyledonous plants: the leaves of the class *Monocotyledoneæ* have the foot-stalk more equally divided at the point where it enters the disk, and thence projected towards the point of the leaf in nearly parallel lines.



Monocotyledonous leaf.

The web of the leaf is filled up between the veins by cellular tissue, having a thin porous cuticle both above and below. The structure of the upper and under surfaces of the leaves are not alike; one is supposed to be furnished with excretory, the other with incretory organs. Water plants, whose leaves are constantly submersed, have no cuticle.

Leaves are either simple, as in the myrtle, or compound, as in the

mountain ash. Compound leaves are distinguished into pinnate, bipinnate, tripinnate, ternate, biternate, triternate, and digitate.

A pinnate leaf is said to be *equal*, when the leaflets are opposite to each other on the foot-stalks; *alternate*, when placed one above another; *terminal*, when the primary foot-stalk has a single leaflet at its apex; *cirrrose*, when it is terminated by a tendril; *abrupt*, when it is terminated by a pair of leaflets; *interrupted*, when the alternate pairs are long and short; *articulate*, when the foot-stalk is jointed between the pairs of leaflets; and *decurent*, when the leaflets have a membranaceous continuation down the foot-stalks.

A bipinnate leaf is when the foot-stalk itself is divided, and branching out into other foot-stalks, each of which supports leaflets corresponding to the simply pinnate leaf in all its modifications.

A tripinnate leaf is of the same description as the above, once more decomposed. The petiole being tripinnate, supporting leaflets as in the former modes.

A ternate leaf is so called, when the foot-stalk supports three leaflets, as is exemplified in the wood-sorrel.

A biternate leaf is when the common foot-stalk supports three others, each of which supports three leaflets.

A triternate leaf is only a further decomposition of the above.

A digitate leaf is when the common petiole supports several leaflets, diverging from a common centre at its apex.

Leaves are either radical, that is, proceeding from the crown or radical plate, or caulinar, that is, borne on the stem; and either sessile or petiolate, that is, either sitting, or having foot-stalks. A sessile leaf is sometimes *vaginant*, that is, sheathing, as in grasses, or *amplexicaule*, stem-clasping, as in many of the umbellifere; or *connate*, situate opposite each other, and united at the base, circumscribing the stem, as in the leaves of the honeysuckle. In some cases connate leaves form cups, which hold rain, probably for the supply of the plant, or they are *decurent*, running down the stem, as in the sow-thistle.

The leaves are the principal organs of respiration, and contribute to the growth by their powers of absorption. Gaseous qualities are emitted as well as inhaled by them; and that they allow the escape of aqueous fluids is well known. As they aggregately present an extensive surface to light and all atmospheric influences, their action in the development of the plant is indispensable. As such, they are with great propriety called "the lungs" of vegetables. They are mainly instrumental in producing a constant flow of sap upwards, in consequence of their perspiring functions. In proportion to the quantity of foliage, in like proportion is the need of and consumption of water. Indeed it is not too much to assume, that hydraulic action is their chief office: the amplification of the system could not take place without



such agency, to excite intestine motion of the fluids, and thereby assist the enlargement of the various membranes. The health and vigor of every plant depends very much on the number and amplitude of the leaves. Defoliation, either naturally, or by art or accident, instantly arrests the growth, and the failure or diminished expansion of foliage is a certain sign of debility. There is a numerous description of plants called succulents, which have few or no leaves, as the torch and melon thistles; but their stems are much dilated, presenting a large superficies of parenchymous exterior to the air and light; or they are profusely covered with spines, which no doubt, conjointly, do the office of leaves.

Green is the most general color of leaves, but some are red, or purple, or yellow; some appear nearly white, in consequence of being clothed with short woolly or silky hair. They differ much in substance and structure; some are immensely thick and fleshy, as those of the genus *aloe*, others remarkably thin, as those of the beech. The texture of the surface is also very dissimilar; some are rough, prickly, and wrinkled, others smooth and glossy. In some leaves, the middle rib and its ramifications or veins are flat, on others remarkably prominent below.

The figures of leaves are extremely various, and sometimes constitutionally variable on the same plant, as in the genus *acacia*; in which the bipinnate leaves of some of the species are changed into a single oblong leaflet called *Phyllodium*, which is also altered in position, one of the edges being for the most part turned to the sky.

The form, size, texture, &c., of leaves, furnish many specific distinctions. Some are named from their resemblance to parts of animal bodies. Others from their resembling instruments of war, or of music, or well-known machines. Others again are named from geometrical figures, or from the heavenly bodies. They have also names to signify to what part of the plant they are attached; as whether *radical*, springing directly from the root; *caulinar*, growing on the stem; *ramcum*, borne on the branches; *axillary*, proceeding from the angle between the stem and a branch: the same term is used in describing flowers, peduncles, or stipules arising from the same place. Leaves are also said to be *floral* when placed near the flower, and *seminal* if they are the first which spring from the seed.

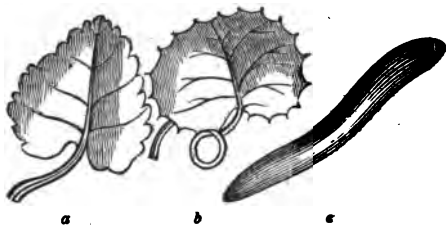
The terms which most commonly occur in descriptive botany are as follow:—

*Cordate*, a heart-shaped leaf or leaflet, as exemplified in the birthwort, fig. *a*, and many other plants.

*Reniform*, or kidney-shaped, when they are much broader than they are long, and rounded at the top, with a notch at the base, as in ground ivy, in fig. *b*. This term is also frequently applied to seeds.

*Linguisform*, that is, tongue-shaped. This description of leaf is frequently seen among what are called succulent plants, as in the families of *aloes* and

mesembryanthemums. It is "linear and fleshy, blunt at the end, convex beneath, and having usually a cartilaginous border," as in fig. c.



*Auriculate*, ear-shaped, or rather having appendages like ears, or lobes at the base, as in the sage and water figwort, fig. d.

*Palmated*, a hand-shaped leaf; exemplified in the common passion-flower, fig. f.



*Digitate*, a fingered leaf. This is distinguished from the palmated leaf, in the leaflets representing fingers, being all attached to the point of the petiole or footstalk; whereas the other has a broad space like a palm of a hand, whence the divisions proceed; the digitate leaf is exemplified in those of the horse-chestnut, fig. g.

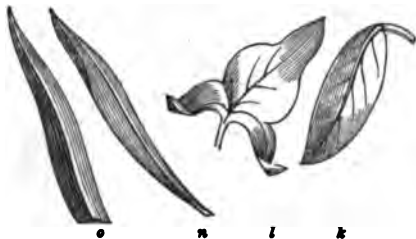
*Pedate*, that is, like a foot of a bird; a leaf divided into several slender divisions, fig. h.



*Ovate*, an egg-shaped leaf, in which the base is somewhat broader than the point, fig. i.

*Oval*, an oval-shaped leaf; in which both ends are equal, fig. j.

*Elliptical*, a leaf like an oval, only more elongated, fig. k. It often happens in leaves of some of the preceding forms, that the broadest part is most distant from the petiole; in which case they are said to be *obovate*, *obcordate*, &c., that is, inversely heart, or egg-shaped.



*Sagittate*, arrow-head shaped leaf. This occurs frequently in the arum family, and many other kinds of plants, fig. l.

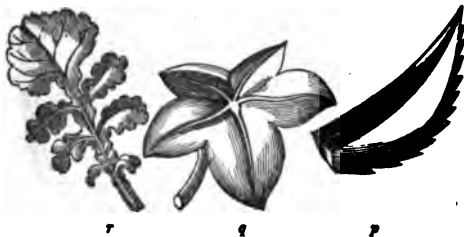
*Hastate*, are such leaves as are shaped like the head of a halbert or battle-axe. This differs but little from the auriculate leaf, fig. d.

*Lanceolate*, an oblong leaf which tapers to each end; this is exemplified in the common ribwort, or ribbed-leaved plantain, fig. n.

*Ensiform*, or sword-shaped leaves, are such as those of the iris, fig. o.

*Acinaciform*, are leaves resembling the Persian scimitar: one edge being convex and sharp, the other nearly straight and thick. Example, *mesembryanthemum acinaciforme*, fig. p.

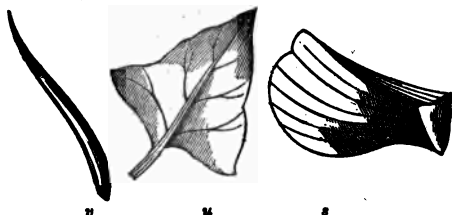
*Peltate*, a target-shaped leaf; in such the footstalk, instead of being inserted into the margin of the leaf, is fixed at or near the centre of the under



surface. The ivy-leaved geranium and nasturtium, or Indian cress, is a familiar example, fig. q.

*Lyrate*, leaves shaped like the musical instrument, the lyre. It is somewhat like a *pinnatifid* leaf, only the terminal segment is very large and rounded, fig. r.

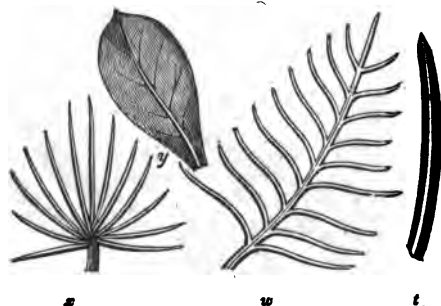
*Dolabriform*, a hatchet shaped-leaf. This very peculiarly formed leaf only occurs among the mesembryanthemums. It is thick and succulent ; narrow where it is fixed to the stem, but spread out and rounded at the point like the edge of an axe, fig. s.



*Acerose*, all leaves which bear a resemblance to those of the yew or fir-tree, are said to be acerose. They are linear, awl-shaped, rigid and ever-green, and either sitting singly and regularly along the branches, or placed in bundles of several together, fig. t.

*Deltoid*, a trowel-shaped or three-sided leaf, resembling the Greek letter delta, fig. u.

*Subulate*, awl-shaped leaf ; it tapers from the base to the point, and is so



called whether it be flattened or hollow ; if the latter, it is said to be *tubular*, fig. v.

*Pectinate*, is a sort of pinnate leaf, only the pinne are so narrow that they resemble the teeth of a comb, fig. w.

*Labeliform*, is a fan-shaped leaf, that is, the disk is split into spokes or radii. The term is mostly used in describing the fronds or leaves of palms. One is represented at fig. x.

*Spatulate*, a form of leaf resembling the instrument used by apothecaries for spreading salve ; that is, a flat knife, very broad and rounded at the point, fig. y.

*Cuneiform*, or, wedge-shaped ; this is very much like what is called deltoid.

*Carinate*, keel-shaped ; said of leaves whose centre of the back is prominent like the keel of a ship.

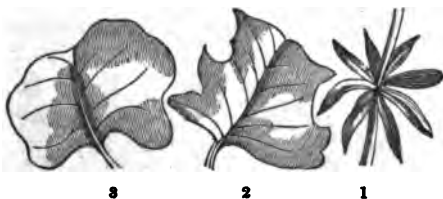
*Lunated*, are such leaves as resemble a crescent or new moon. In some plants the horns point toward the stem, in others from it. In either case, they are said to be lunated.

*Stellated*, is a star-like leaf, or rather leaves placed in star-like order. This term is however seldom used ; *verticillate* is the term applied to such leaves as stand round the stem like rays pointing every way, as those of the cleavers and woodroffe, fig. 1.

*Cucullate*, leaves are called cucullate, if they take the shape of a cowl or hood reversed ; that is, wide at top and narrowing to a point at bottom.

*Truncated*, is spoken of a leaf which appears as if its apex were cut off, as those of the common saddle-leaved tulip tree, fig. 2.

*Retuse*, leaves are said to be retuse when they terminate bluntly, or have a slight sinuosity instead of an acute point, as fig. 3.



*Unequal*, is when the two sides of a leaf do not correspond in size, as may be observed in those of the elm.

Besides the foregoing, there are several other forms of simple leaves introduced into specific descriptions of plants, such as *bifid*, *trifid*, *quadrid*, that is two, three, four-cleft, and so on. There are also *orbicular*, *round*.

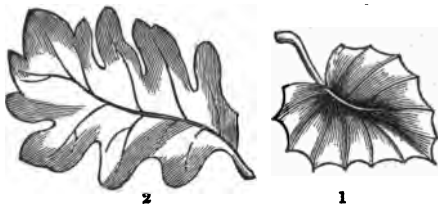
and *cylindrical* leaves, with modifications of these into *subrotund*, roundish ; *rhomboid*, diamond-shaped ; *linear*, all of the same breadth ; *integrum*, entire, or undivided ; *lobed*, *parted*, *lacinated* or torn, &c.

#### MARGINAL DISTINCTIONS OF LEAVES.

Hitherto the general outline or form only of leaves has been noticed ; we have next to advert to the terms used by botanists in describing the margins of leaves, and which are applicable to all leaves, whether simple or compound.

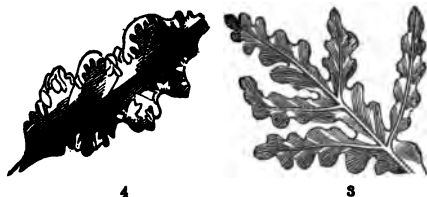
*Integerrimum*, most entire ; this term is only used in allusion to the margin, not to the leaf itself. A leaf may have many sinuosities, as the passion-flower for instance, and yet have an entire margin like a hem all round ; and it is in this sense that the term only *integerrimum* is used.

*Repand*, bowed or bent back, in consequence of the margin being confined by internal segments of circles preventing the horizontal expansion of the leaf, fig. 1.



*Sinuated*. Leaves having deep rounded indentations like those of the oak, fig. 2.

*Undulated*. A leaf receives that character when its margin is waved up and down vertically like those of the holly, but without prickles, fig. 3.



*Crispum*. That is, having the margin curled or contorted like some varieties of cabbage, fig. 4.

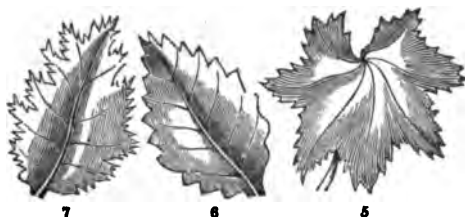
*Plaited*, "folded like a fan, the plaits being acute." This beautiful conformation is exemplified in the common meadow plant, called ladies' mantle, fig. 5.

*Eroed*. That is when the margin is so irregular that it appears as if gnawed by an insect.

*Cartilaginous*. This is spoken of some leaves whose margin is composed of a harder substance than the rest of the leaf.

*Glandular*. That is, when the edge of the leaf is studded with little glands or processes.

*Dentated*. When the margin is cut into teeth, or projections shaped like the canine teeth of animals, fig. 6.



*Doubly-dentate* is when the teeth are each indented and all pointing upwards, fig. 7.

*Serrated*. That is, when the margin is cut like a saw, fig. 8. When the projections are small and fine, the margin is said to be serrulate.



10  
Pine apple.

9  
Ground ivy.

*Crenate* is when the projections are blunt, and point neither upwards or downwards, fig. 9. The margin so described may be either obtusely crenate, acutely crenate, or doubly crenate.

**Armed.** This is said of leaves whose margins are defended with prickles, as the common holly, the pine apple, and many other plants, fig. 10.



11

12

**Runcinate.** Leaves are called runcinate when the margin is cut into deep gashes like the teeth of a pit saw, the points of the teeth pointing backwards, exemplified in the common dandelion, fig. 11.

**Ciliated,** from cilium, an eyelash. This term applies to the margin of the leaf, and means that it is fringed with hairs, fig. 12.

#### TERMS DESCRIPTIVE OF THE SURFACE.

**Wrinkled.** The leaves of sage, and all others similar, are said to be *rugose* or wrinkled, caused by the web of the leaf between the veins being more dilated than the veins themselves.

**Blistered.** Having a surface like the preceding, only extremely so.

**Lacunosum.** That is, pitted on the upper surface, caused by the depression of the web of the leaf between the more rigid veins.

**Punctated.** The surface covered with dots, usually "arising from glands imbedded in the surface of the leaf."

**Colored.** Leaves are said to be colored when they are of any other color but green.

**Ribbed.** A leaf is said to be ribbed when the divisions of the mid-rib or costa run in direct and parallel lines from the centre to the margin.

**Nerved.** When the nerves run in lines from the base to the point.

**Veined.** When the divisions of the costa are numerous, and form a network over the web of the leaf.

**Armed.** When the disk is partially covered with prickles, as the thistle, rose, and some varieties of holly.



## OF THE SITUATION OF LEAVES.

If a leaf be seated upon, and clings closely to the stem, it is said to be *adpressed*. If leaves rise from the stem one above another on opposite or on nearly opposite sides, they are described as *alternate*. If their bases surround the stem, they are said to be *amplexicaule*. If so thickly placed as to hide the stem, they are said to be *conferted*. If two opposite leaves are united by their bases, so that the stem appears to run through them, they are said to be *connate*, that is, growing together. If the leaves of water plants grow under the surface, they are described as *submersed*; if above the surface, they are *emersed*; and if they float, they are said to be *natant*.

Some of these have been already described, and two of them (the palmate and digitate) have been already figured at page xl; we now proceed to name and give figures of those of most common occurrence.

A compound leaf differs from a simple one in this, that whereas the latter stands singly on the petiole or footstalk, the former stand in pairs, threes, &c.

If two leaflets are borne on the footstalk, they are said to be *binate*, fig. 1.



If the petiole divide at the summit, and each division end in two leaflets, it is called *bigeminate*, or a twice-twinned leaf, fig. 2. If one petiole bears three

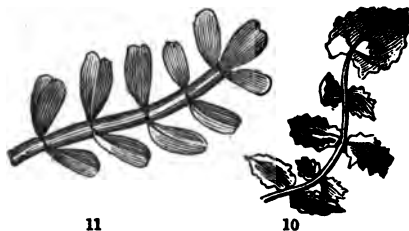


leaflets attached to the end, it is called a *ternate* leaf, example the wood-sorrel, or shamrock, fig. 3. If the petiole be divided, and on the end of each division three leaflets be attached, this disposition is called *biterate*, fig. 4. Suppose again that the petiole has three branches, each bearing three times three leaflets, then we have a *triterate* compound leaf, fig. 5.

When a petiole is undivided, but bears on each side any number of leaflets, either placed alternately as in opposite pairs, it is said to be a *pinnated* or winged leaf, fig. 6. In describing such a style of foliage, it is usual to particularize the number of *pinnae* by the terms *trijugous*, *quadrijugous*, and so on.



Sometimes the pairs of leaflets are equal, in which case the leaf ends abruptly, hence called *abruptè pinnatum*, fig. 7. But if the petiole bears, besides the side ones, a single leaflet at the end, then it is called *pinnated with an odd one*, fig. 6. If instead of this odd leaflet at the end, the extreme point of the petiole be resolved into a tendril, as is the case with the pea, then it is called *pinnatum cirrhosum*, fig. 8.



Another form of winged leaves is called *interruptè pinnatum*. This is, when between every larger pair of leaflets a smaller pair is placed, fig. 10. A compound leaf, which has the leaflets connected by a leafy expansion running along the edges of the petiole, is called *decursively pinnate*. If the

petiole be articulated at the points where the pinnæ are fixed, the whole is called *jointedly pinnate*, fig. 11. When a petiole is divided and bears pinnæ on each division, it is called a *conjugately pinnate* leaf, fig. 12.



In the digitate leaf <sup>13</sup> each leaflet is entire; and there are digitate leaves <sup>12</sup> where the leaflets are pinnated, hence called *digitatum pinnatum*, being both fingered and winged, fig. 13.



Bipinnate and tripinnate leaves may be easily understood by a glance at the cuts by which they are represented, figs. 14 and 15.

There are some plants whose leaves are of so remarkable a shape, that they do not belong to any of the foregoing characters. Of these we may notice the pitcher plant (*Nepenthes distillatoria*.) The proper leaves are lanceolate, and beyond the apex of each the mid-rib protudes like a tendril to the length of several inches. The extremity of this tendril becomes inflated into a bladder-like vessel, two or three inches in length, and nearly one in diameter; the outer extremity of the bladder is open, but supplied with a hinged lid which shuts close upon it, like the lid of a flagon. The vessel is always more or less filled with water, which appears to be distilled from the plant itself, as the lid prevents rain falling directly into it. No

## INTRODUCTION.

rational account has yet been given of the use of this appended cistern, to the plant itself, or to any other creature near it.



*Nepenthes distillatoria.*

There is another plant (*Cephalotus*), which is furnished with similar, but far more elegant appendages of the like kind. Both are marsh plants, and therefore it is the more remarkable that they should have reservoirs for the retention of the very element in which they stand.

The *Dionaea muscipula*, or vegetable fly-trap, may be mentioned as having leaves of very odd conformation. At the point of each leaf two smaller leaflets are placed opposite each other, on hinges at bottom. These open and shut against each other, and their upper edges are furnished with bristles, which fit in between each other crosswise when shut. In fine weather they are generally wide open; and should a food-seeking fly creep into the furrow between the leaflets, these suddenly collapse and crush the intruder to death.

~m~

## OF THE STIPULA.

The *Stipula* are the next leaf-like expansion to be noticed: they are sometimes single, but very frequently double, and situate at the base of the

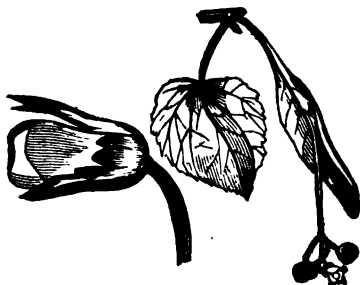


*Stipula.*

petiole, or leaf-stalk, one on each side, as shown in the figure. Sometimes they are united to the petiole, or changed into prickles, as in the berberry. In some of the grasses the stipula is single, investing the culm a little above the limb of the leaf, whence they are said to be intrafoliaceous; and when seated on the outside of the petiole, they are said to be extrafoliaceous. In some plants the stipulæ embrace the stem like a sheath; in others they invest the top of the shoot, as in the fig tree. Stipulæ generally fall with the leaves.

## OF THE BRACTE.

THIS is a foliar appendage which accompanies the flower, but different from both the proper leaves and the members of the flower in shape and texture, and frequently in color. Though most commonly seated below the florets, as in *Justitia*, it is above them in *Eucomis*. In some instances it



Bracte of the lime and helleborus.

resembles the proper leaves, as in *Mespilus*; but is often of a membranous texture, as in *Helleborus*. In some of the *Orchideæ* the leaves are gradually resolved into bracte, so that it is difficult to decide where the leaves terminate, and the bracte commence. The chaff of grasses are bracte.

## OF THE INVOLUCRE.

*Of Involucre.* This is allied to bracte, but as it occurs conspicuously on umbelliferous plants, it is deemed proper on this account to distinguish it by this name. The involucre consists of one or more leafy expansions, differing in shape from the proper leaves of the plant, situate at the base of an umbel. When at the base of a compound umbel it is called the general involucre, and when at the base of the partial umbel the involucellum. The bracte of

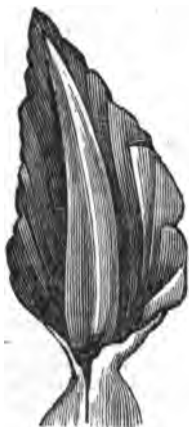
INTRODUCTION.



Involucrum and involucellum of a phlox, and involucre of the Chinese primrose. the anemone has been supposed to be involucre, but this is not generally allowed.

OF THE SPATHE.

This member is the membranous covering which involves the flowers of Spathe.



Arum.

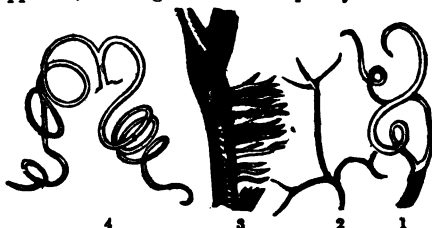


Narcissus.

the snowdrop, onion, arum, and palms before their expansion. By some botanists it is called bracte, by others involucre, but as it is not decided which it really is, it is as well to call it by the conventional term most generally known.

#### OF THE TENDRIL (CIRRHUS).

The tendrils are those convolving strings or claspers by which plants are occasionally supported, winding themselves spirally around certain neigh-



bouring objects, as may be seen in the preceding figures. They are produced on different parts of flexible stems, and attach themselves to other bodies for support; on the grape-vine they are exerted from the young shoots opposite the leaves, as in fig. 1; in the pea the points of the foot-stalk of the leaves are resolved into compound tendrils, as in fig. 2; the superb lily bears them on the points of the leaves; and on the ivy they are short processes issuing from the bark, as in fig. 4.

#### OF THE ARMATURE OF PLANTS.

Plants are furnished with defensive appendages called spines, prickles and stings.

*Spines (Spine)* are woody processes issuing from the stem, and appearing to be abortive shoots, as those of the white thorn and wild crab apple; from the points of the leaves, as butcher's-broom; from the calyx, as the thistle; from the seed vessel, as the thorn apple; and from the seed, as spinach.

*Prickles (Aculeus)* are situate on the bark, and appear to be articulated therewith, as in the rose and gooseberry. Sometimes they take the place of other members of the plant, as instead of stipulæ in the berberry, and bastard acacia. In the genus *Mammalaria* and other succulent plants, prickles appear to do the office of leaves.

*Stings (Stimuli)* are a smaller kind of prickles, but with this difference, they emit a poisonous juice into the punctures made by them, causing painful irritation and inflammation. Example, the common nettle.

*Glands* are small protuberances seated on various parts of plants. They

are either secretory or excretory organs. Fibrous roots are observed to issue from those situate on the bark of the common laurel, if the branch be layered in the ground. Professor de Candolle remarks that these bear the same relation to the roots that buds bear to young branches. They are very conspicuous on the petioles of the peach and passion-flower. Glands are described by botanists under various names, as milairy, bladder, scaly, lenticular, cup-shaped, and utricular, the latter being very visible on the young shoots of the vine, and on several species of fig-marigold, appearing like globes of crystal.

*Pubescence.* The exterior cuticle of plants is either perfectly smooth and naked, or covered with hairs; in some cases, soft and fine as silk, as the silver tree (*Protea argentea*); or rough and harsh (*asper*) when the whole plant is covered with short rigid bristles, as borage. Botanists employ many different terms in describing this clothing of plants, viz., *hirsutus*, hairiness; *villosus*, villous; *tomentosus*, downy; *glochidatus*, barbed or bearded; *sericeus*, silky; *arachnoid*, cobweb-like; *rostellata*, hooked, &c.

*Scales.* The cuticle of some plants is profusely covered with scale-like processes, giving a grayish hue to the surface. They are microscopic objects, and may be met with on the leaves of the pine-apple; plants bearing them are said to be leprous (*lepidotus*). Another cuticular excrescence of a scale-like character is borne on the young shoots and backs of the leaves of ferns; these are called *ramenta*.

#### OF THE FLOWER AND FRUCTIFICATION.

The members of the flower are the calyx, corolla, stamens, disk, nectarium, pistillum, and receptacle.

*The Calix.* This is the external investment of the flower, and in which it sits as in a cup. The common calix is sometimes entire, in which state in some instances it is thrown off by the growth of the corolla and stamens. More frequently, however, it is divided into segments (*sepals*), which separate from each other more or less from its outer edge downwards. It is most commonly green, but in some flowers it is highly colored. In size the calyx varies from a mere ring to a considerable tubular expansion. It is said to be inferior if situate below the ovarium, and superior if attached to its side, or seated on its apex, as exemplified in the apple and pear. In some cases it is double, or formed of many scales, as in the camellia; and in syngenesious flowers, as the artichoke, that part which used to be called a scaly calyx is now called *Anihodium*. In some flowers, as the tulip, it is said to be wanting. In the flower just named, some botanists consider the three outer petals calyx, and the three inner ones corolla. This organ is usually deemed the external defence of the more delicate members of the flowers; but besides this its most ostensible office, it is destined to perform others, and to be transformed into the most valuable products of the plants. In the order *Gymnosperma*,



of the class *Didynamia*, the calyx becomes the seed-vessel; and in the genus *Pyrus*, the incrassated bottom of the calyx becomes the fruit.

## OF THE COROLLA.

The *Corolla* is the delicate and usually high-colored row of leaves or petals which stand immediately within the calyx. If the petals are distinct from each other they are said to be *polypetalous*, if uniting into a tube the corolla is said to be of one petal (*monopetalous*). When thus united, the tube is of more or less length and the lip more or less open; if regularly divided, and the divisions diverge regularly, it is said to be wheel-shaped (*rotate*); if so flatly as to resemble a plate, they are called salver-shaped (*hypocrateriform*); or funnel-shaped (*infundibuliform*); or bell-shaped (*campanulate*); or lipped (*labiate*). If the exterior lips or edges of the corolla be unequally divided, and if the upper division be arched, that is bending over, it is called the helmet (*galea*); if the lips be very wide apart, the corolla is said to be gaping (*ringent*); if the upper and lower divisions meet and are pressed together, it is said to be like a mask (*personate*). The central opening of such a corolla is called the throat (*faux*), and the petals which form it when separately considered are said to consist of two parts, viz., the claw (*unguis*), by which it is fixed to the receptacle, and the lip or border (*limbus*) which is expanded in the air.

According to the order in which a many-petalled corolla is disposed, botanists have designated them by different appellations, viz., like a rose (*rosaceous*); like a lily (*liliaceous*); like a pink (*caryophyllaceous*). Some are disposed like a cross, hence called *cruciform*; others resemble a butterfly (*papilionaceous*); and the different members of these last named flowers receive characteristic names, viz., of five petals, the upper one is called the standard ( *vexillum*); the two side ones are the wings (*ale*); and the two lower ones being united form the keel (*carinae*).

The corolla of a floret is called *corollula*; if the corolla be wanting, the flower is said to be *apetalous*; and if a part of the corolla be lengthened behind into a hollow tube, it is called a spur (*calcar*). Example the larkspur.

From the great variety of forms in which the corolla is exhibited, the terms equal and unequal, regular and irregular, are properly applied; and though in the generality of plants it forms but one rank of petals within the calyx, yet in some there are several, as in the flowers of the water-lily.

The corolla is sometimes furnished with certain appendages attached to the throat, or to the interior base of the petals. These are commonly called *nectarium*, because they hold and are supposed to secrete honey. They are sometimes in the shape of a rim or cup encircling the throat, as in the auricula; like erect scales at the bottom of the claw, as in the ranunculus; or extended like a trumpet, so conspicuously beautiful, as in some species of *narcissus*. In the passion-flower it is divided into numerous parti-colored

filiform rays like a rich fringe. When the corolla is prolonged into a spur behind, it is also called the nectary.

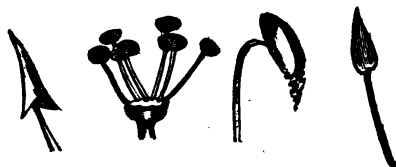
#### THE STAMENS.

These are situate within the corolla, and are the male parts of the flower, consisting of three distinct members, viz. the filament, *a*, the anther on its summit, and the pollen or dust discharged from the anther *c*. In some plants the filament is wanting: but the anther and pollen are essential. The filaments when present serve to place the anthers above or on a level with the female organ or stigma of the flower, and are of different lengths, and assume different positions, according to the position of the flower. If the flower stands erect, the filaments are as long, or longer than the style; but if the flower nods, or hangs, they are usually shorter. The filaments either



Different forms of anthers.

stand distinctly separate from each other or are united by a membrane at their bases, in which case they are called a brotherhood (*adelphia*); if in one united rank they are said to be one brotherhood (*monadelphous*); if in two, three, or many ranks one within another, the flower is called *diadelphous*, *triadelphous*, or *polyadelphous*. If two out of four stamens be shorter than the other two, the flower is said to be *didynamous*; if two out of six are longer, the flower is *tetradynamous*.



Different forms of anthers.

In some flowers, as swallow-wort, the filaments converge towards the

centre, and there unite and form a solid body called *columna*; in which are locaments for the anthers.

The anther is composed, in most instances, of two cells, containing pollen, and generally fixed to the apex of the filament. If attached by their base, they are said to be *innate*; if by the back, they are *adnate*; and if by a single point near the middle, so as to swing, they are called *versatile*. When fully ripe, the cells burst longitudinally, or at the ends, to allow the escape of the pollen. Sometimes the latter is discharged by an elastic force.

The pollen is the matter which contains the fecundifying influence or principle, without the contact of which the seeds already formed in the ovary would be abortive. The granules of the pollen are of various forms; under the microscope, they appear to be globular, oval, square, &c.; that of the sunflower is like a prickly ball, of mallow toothed, like a watch-wheel. Some have little tails (*caudicula*), and others are discharged in masses, several adhering together. The dispersion of the pollen is not only caused by the spontaneous action of the anthers, but is much facilitated by the visits of bees and other insects. The stamens are very fugitive, disappearing very shortly after the pollen is discharged.

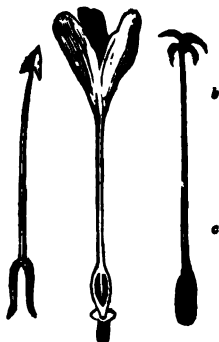
#### THE DISK.

Between the base of the stamens and that of the seed-vessel there is a vacant space, or raised rim, of regular or irregular projections, called by modern botanists the disk, and which, by Linnæus and his followers, is called nectarium. This member of the flower is not always met with in the place assigned to it, for it is sometimes above the germen. It also assumes so many different forms, that the most acute botanists are puzzled to find a proper name for it. Sometimes it is only a little shining cavity, or slight groove, in each of the petals; sometimes, as before observed, it is an erect scale at the bottom, or a fringe on the throat of the petals. In some cases it forms the principal member of the flower, as in the narcissus and ladies' slipper, in which two instances the forms do not all accord with the title. But, whatever may be the station, shape, or size of the disk, it is considered in the modern schools of botany to be only imperfect, or metamorphosed portions of some of the other members of the flower.

#### OF THE PISTILLUM.

This is the principal organ of the fructification, and occupies the principal station, namely, the centre. It is the female, or reproductive part of the plant, and consists of three divisions, viz., the seed-vessel or germen *a*, the style *b*, and the stigma *c*.

## INTRODUCTION.



The first and third of these divisions are constant; the second is sometimes wanting.



Forms of pistillum.

The seed-vessel has all the other members of the flower placed around or upon it. If below all the other parts, as in the pear and gooseberry, it is said to be inferior; if above the calix, corolla, and stamens, it is said to be superior, as in the peach, orange, &c. It is one or many-celled, and contains one or many seeds. In one class of plants it is formed of the calix, the seeds lying naked in the bottom; hence such flowers are said to be gymnospermous. The seed-vessel is usually seated on the receptacle, hereafter to be described, but is sometimes elevated on a peculiar kind of stem, called *thecaphore*, either singly or several, in a kind of bunch.

As the ovarium is very differently constructed, and assumes many different shapes, it has many characters applied to it. In Linnæan botany it is called

*capsula*, a little chest; *siliqua*, a pod; *silicula*, a short pod; *legumen*, also a pod; *folliculus*, a little bag; *drupa*, a pulpy valveless integument; *pomum*, an apple; *bacca*, a berry; and *strobilus*, a woody cone. Some of these names have fallen into disuse, and new ones, of more apposite meaning, substituted. Dr. Lindley, in his "Introduction to Botany," 1832, has arranged seed-vessels into four classes, viz.: First, *APOCARPI*, containing four divisions, namely, *Utriculus*, one-celled; example, *Amaranthus*. *Achenium*, one-seeded; example, *Borago*. *Drupa*, one-celled, one or two-seeded; example, *Plum*. *Folliculus*, one-celled, many seeded; example, *Pæonia*. *Legumen*, a pod; example, *Pea*. *Lomentum*, differs from the legumen in having contractions between each seed; example, *Ornithopus*. Second, *AGGREGATA*, fruit aggregate, viz., *Elaeis*, ovaries distinct; examples, *Ranunculus* and *Fragaria*. *Syncarpium*, ovaries cohering into a solid mass; example, *Magnolia*. *Cynarrhodum*, ovaries distinct, pericarpia hard; example, *Rose*. Third, *Syncarpi*, fruit compound, viz., *Caryopsis*, one-celled, one-seeded; example, *Wheat*. *Regma*, three or more celled; example, *Euphorbia*. *Carcerulus*, many celled, superior; example, *Mallow*. *Samara*, a key, two or more celled, superior; example, the *Ash*. *Pyridium*, one-celled, many seeded; example, *Anagallis*. *Conceptaculum*, two-celled, many seeded; example, *Asclepias*. *Siliqua*, one or two-celled. *Silicula*, similar in structure to the preceding, only more rotund; example, *Shepherd's Purse*. *Ceratium*, one-celled, many seeded; example, *Corydalis*. *Capsula*, one or many seeded; example, *Primrose*. *Amphisarca*, many celled, many seeded, pericarpium fleshy; example, *Adansonia*. *Tryma*, by abortion one-celled; example, *Juglans*. *Nuculnaum*, two or more seeded; example, the *Grape*. *Hesperidium*, many celled, few seeded; example, *Orange*. *Glans*, one-celled, one or few seeded; example, the *Oak*. *Cypsella*, one-seeded, one-celled; example, all compound flowers. *Cremonocarpium*, two to five-celled, inferior; example, umbelliferous plants. *Deplotegia*, one or many celled; differs from the capsule only in being adherent to the calyx; example, *Campanula*. *Pomum*, two or more celled; example, the *Apple*. *Pepo*, one-celled, many seeded; example, the *Melon*. *Bacca*, a berry, many celled, many seeded; example, the *Gooseberry*. *Balausta*, many celled; example, *Pomegranate*. Fourth, *ANTHOCARPI*, collective fruits, viz., *Diclesium*, one-seeded, indehiscent; example, *Spinach*. *Sphalerothecium*, one-seeded, enclosed within a fleshy perianthium; example, the *Yew*. *Syconus*, a fleshy rachis, having the form of a hollow receptacle; example, the *Fig*. *Strobilus*, cone, an amentum, the cupella of which are scale-like; example, *Pinus*. *Sorosis*, a spike, converted into a fleshy fruit by the cohesion of the ovaria with its envelope; example, *Mulberry*.

These are the names or titles by which the different forms and structure of seed-vessels are known among botanists, and which, when committed to memory, are of the greatest use in abridging descriptions of plants, seeing

that a single term, properly applied, serves the purpose of very many words. The most common forms of fruits are the, berry, nut, legume, and pome.

Seed-vessels are two or many valved. The junctures are called *sutures*, to which the seeds are sometimes umbilically attached. If the seeds are borne on an internal member, it receives the name of *placenta*; and if the capsule be divided by membranous partitions, these are called *dissepiments*.

The *Style* is that portion of the pistillum which, when present, serves to elevate the stigma. It is usually seated on the topmost part of the germen, and is of various lengths, sometimes protruding beyond all the other members of the flower. In form it is commonly cylindrical, and in structure tubular, to permit the descent of the influence of the pollen, which is disintegrated upon the stigma. Sometimes the style is entirely absent; in which case the stigma is seated close upon the capsule, as it appears on the poppy. As soon as the ovarium is impregnated, the style shrinks and withers away, leaving on some fruits a very small portion of its base. In many plants there is but one style, but in several of the Linnæan classes there is a plurality, so that the term *polygynia* (many females) is frequently used. The style and stigma are the most delicate members of the flower, being more easily injured by frost, or withered by the sun, than the other less essential organs.

The *Stigma*. This organ is always borne on the summit of the style, if the latter be present; or, in default of this, on the apex or crown of the germen or ovarium. It is the only part of a plant which has no cuticle, and, when perfect, is usually covered with a thin lymph or fluid, the more readily to catch and retain the pollen discharged from the anthers upon it. In this fluid it is said the granules of pollen undergo some kind of change or solution preparatory to the descent of their influence into the ovarium. This change of the pollen has been repeatedly observed; and from the effects of foreign pollen artificially applied, there can be no doubt but that this is the course in which the sexual powers of plants are united and consummated.

The pistillum, consisting of the three divisions just described, is pretty uniform in appearance in most of the Linnæan classes, except *Syngenesia* and *Gynandria*, the *Compositæ* and *Orchidææ* of Jussieu. In the latter named order the filaments of the anthers and the style of the pistillum are united, forming a column on which both anthers and stigma are seated, but in such positions as to make the means of contact not very apparent. But diligent observers have discovered that there is not only a channel of communication, but a peculiar mechanism and elastic power in the filaments, by which a conjunction takes place with the greatest facility.

The *Receptacle*. This is the last member of the flower which remains to be noticed. It is that part on which all the other members are seated, either directly or indirectly. The calix is usually borne on its edge; the corolla, stamens, and pistulum, on its disk. It is the termination of a fruit-bearing branch, or that of a peduncle, and is either nearly flat, elongated out in the shape of a slender cone, or enlarged into a thick fleshy cup.

The foregoing are the names of the different parts or members composing a perfect flower, but they are not all present in every flower. In some instances the calyx is wanting, or merged in the corolla, as in the tulip; in the mezereon the corolla is absent, or it is absorbed into the calyx, which is colored. Filaments are sometimes produced without anthers, and in some plants this defect appears to be constitutional, as the filaments are alternately barren and fertile. Some anthers have very short, or no visible filaments, they being non-essentials. The disk is often wanting, or inconspicuous, and so is the style; but the stigma, seed-vessel, and anthers, must all be present to constitute a perfect flower in its normal or natural state. Some of these members, as has already been stated, are quickly perishable, others persisting to complete their functions. For instance, the calyx of the apple is united to the undistinguishable base of the corolla and envelope of the ovarium, becoming a thick pulpy mass, bearing the sepals, which form the crown or eye, as it is called, of the fruit. The like is the case in the gooseberry. The strawberry is a fleshy receptacle: so is the fig. The peach, and other stone fruit, are pulpy pericarpiums composed of an outer skin (*epicarpium*), an intermediate pulp (*sarcocarpium*), and the stone (*endocarpium*), containing the ovula.

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## CHAPTER IV.

### OF SYSTEMATIC BOTANY.

SYSTEMATIC botany has no very alluring aspect to a beginner. The great number of titles of the classes and orders, to say nothing of the generic and specific names, is a bar to commencing the study of the science. But when set about in earnest, the first difficulties quickly vanish; still much attention and time is required before such a knowledge of it can be acquired as to yield real pleasure to the student.

Initiation into this, as into all other sciences, is laborious; stepping over the threshold is a kind of mental drudgery, and is in fact the most irksome part of the undertaking; but when the student is fairly within the pale, the different avenues into the interior and more occult regions of the science are opened up; those thick clouds of difficulty which timidity or indolence had formed, are soon dispersed, and the student finds himself in an open expanse—in a new world, where he finds a thousand new objects which he can name at first sight. When this much is attained, the study becomes every

day more and more interesting ; every new plant is sought and examined with avidity : research is no longer toil ; on the contrary, such investigation becomes delightful exercise, yielding positive pleasure ; while every accession to the previous stock of knowledge is attended by fresh gratification.

The amateur botanist proceeding in this way soon acquires a competent knowledge of this pleasing science ; he gradually becomes cognisant of the greater features, and gains such an insight into the details as dispels every obscurity which he thought he saw before him on his first entrance on the study. And when this much is accomplished, he enjoys every satisfaction that can arise from the knowledge of one of the most interesting branches of natural history, and which, moreover, is a necessary accomplishment of every well-educated mind.

To ladies particularly, and to the young of both sexes, the study of botany is a most agreeable exercise and amusement. Flowering plants always claim the regard of the young, of refined minds ; and none are more enthusiastic lovers of fine plants than the aged botanist. For the pencil of the female artist, where can such elegance of form and delicacy of color be found for imitation as in the parterre ? or what can embellish the dwellings of the rich, or cottages of the poor, more than the floral products of the garden ?

Many are lovers of flowers who are not at the same time botanists. This feeling is as innocent as it is rational ; it is a source of pleasure, but only in a subordinate degree to that enjoyed by those who to their love of flowers add scientific knowledge ; who not only know the name, but can tell to what class or tribe the plant belongs, — whether native or foreign, — whether sanatory or noxious. No portion of human lore in natural phenomena yields more gratification to the well-constituted mind than a scientific knowledge of plants.

To be a practical or professional botanist requires a long lifetime of close application and study. To store in memory nearly one hundred thousand names requires a power of retention enjoyed by few ; and to nomenclature must be added a knowledge of the history of plants, — their natural habitat as well as their culture : without an intimate acquaintance with these things no one can be a practical botanist.

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### THE LINNÆAN, OR SEXUAL SYSTEM.

THE sexuality of plants had been discovered long before the time of Linnæus. But as far as is now known, he was the first who suggested the idea of classifying plants according to the numbers, connexion, and stations of the male and female organs. From the moment the idea occurred to him,



he was indefatigable in the completion of a system which he, no doubt, fondly flattered himself was founded in nature. His great acquirements as a scholar, his love of natural history, his station among learned men, and his connexion with many learned societies, eminently fitted him for achieving this great and laborious work.

The plan of the Linnæan system of botany was intended to comprehend the whole vegetable kingdom, which was arranged in two grand divisions, namely, plants having visible flowers (*Phænogamia*), and plants having no visible flowers (*Agamia* or *Cryptogamia*).

The first grand division comprises twenty-three classes, founded on the number, the position, and stations of the stamens and pistils. The first eleven classes proceed in an uninterrupted series, from one to twelve stamens, and are named respectively from their number. The terms used to express the classes, are compounded of the Greek numerals and the word *andria*, signifying man. These classes are subdivided into orders, which are designated from their number of pistils by Greek numerals also, with the addition of the word *gynia*, which signifies woman. There being no plants which have invariably eleven stamens, this class in the order is called *Dodecandria*, and contains all plants having from eleven to nineteen stamens. The twelfth class is known from having twenty or more stamens, seated upon the corolla or calyx, and which sufficiently distinguishes it from the thirteenth class, which has also twenty or more stamens, but these are seated on the receptacle or base of the flower.

The fourteenth and fifteenth classes are distinguished, not by the number of their stamens, but by their unequal length: the first has four stamens, two of which are longer than the others. This class is further distinguished from having invariably ringent, that is, gaping flowers. The fifteenth class has six stamens, four long and two short, with one pistil and cross-shaped flowers.

The sixteenth class is known by having the filaments united in one body at the bottom, and without regard of their number. The seventeenth class has stamens united in two sets, and is otherwise easily known from having also papilionaceous flowers. The eighteenth class has its stamens in three or more sets. The nineteenth class contains all the compound flowers, and a few other genera having single flowers. The leading character of this class is in the anthers being united in a cylinder round the style. The twentieth class is known by having its anthers growing on the pistil, and not on the receptacle. The twenty-first class has male and female flowers separate, but on the same plant. The twenty-second has male flowers on one plant, and females on another. The twenty-third class contains those genera which have not only unisexual flowers on different plants, but also bisexual flowers intermixed. The twenty-fourth class contains all plants whose flowers are inconspicuous. To these Linnæus added another class, or rather appendix,

which he called *Palme*, the flowers of which were not sufficiently known in his time to admit of their being properly placed in the system. They are now distributed into the various classes and orders of the sexual system; they are still kept separate by Jussieu, who has, as Linnæus did, arranged them into an order by themselves under the old name. In fact, the genus *Palme* is of all others the least associable with the Linnæan plan of arrangement; being as distinct a tribe of plants, in their structure, forms, and manner of growth, as can be found in the whole vegetable kingdom. Still there were stations provided for them in the sexual scheme, where they have been placed by late writers; but, as already observed, they do not associate well with the genera among which they are ranked. For instance, who would imagine that the cabbage-palm (*Areca oleracea*) and the Scotch pine (*Pinus sylvestris*) were any way allied to each other? Yet the Linnæan botanist must unite them, because their flowers are respectively monœcious, and their stamens are united in one brotherhood.

The foregoing is a general sketch of the classes of the Linnæan system. They are easily distinguishable from each other, and with but very little trouble. A large specimen-flower of each of the first classes, and pairs of flowers of the three following classes carefully examined, will, in a very short time, show the student the distinctions on which Linnæus founded them. This will be one very material step gained towards acquiring a clear view of the system, and as we proceed to point out the subdivisions or orders of each class, the figures of the parts on which the distinctions are formed, will give as clear a view of the whole sexual system as is consistent with the plan of this work.

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#### FIRST CLASS : MONANDRIA.

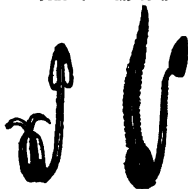
THE flowers of this class are furnished with one stamen: it contains only thirty-three genera, and two hundred and fifty species. The first order, MONOGYNIA, that is, having one pistil and one stamen, contains many highly ornamental exotics; and the *Zingiber officinale*, the common ginger, is an important article of commerce; the seeds and roots of many plants in this class are used in medicine, as well as by the dyer, as galangale, turmeric, arrow-root, and zedoary. Their predominating qualities are aromatic. They are chiefly reed-looking, herbaceous plants, with large leaves and showy flowers. Several of the genera are American, as *Salicornia*, *Canna*, &c. All the plants alluded to above are in the first order, MONOGYNIA, they having only one pistil. In the second order, DIGYNIA, having two pistils, there are seven genera, one of which is the *Callitriche*, or water starwort, which is also an aquatic, being frequently met with in ditches.

## CLASS DIANDRIA.

lxv

There is another plant, sometimes sown in flower borders as an ornamental annual, which belongs to this order. Its chief ornament is its fruit, which

### Class Monandria.



### Digynia. Monogynia.

are thickly set on its branches, resembling strawberries: hence it is called strawberry blite, — *Blitum capitatum*. The sexual distinctions of this first class, with the two orders, are represented in the preceding figures.

## SECOND CLASS : DIANDRIA.

THE flowers of this class have only two stamens. There are sixty-one genera in this class, which are divided into three orders.

The first order, *Monogynia*, having one pistil, contains by far the greater number of the genera. Here we find the useful olive, the beautiful and fragrant jasmine, and many fine evergreen shrubs. The lilac, the fringe tree, and catalpa, also belong to this order. Nor are the herbaceous plants found here less prized. The wild and cultivated speedwells, the delicate schizanthus, the showy justicias, and the elegant slipperworts, are some of the choicest gifts of Flora. The rosemary, and numerous species of sage,

### Diandria.



Trigynia.

Digynia.

Monogynia.

those fine medicinal plants, are ranked in this order. "The structure of the stamens in the sage is singular: the two filaments are very short, but two others are fastened to these transversely by the middle; and at one end of these is a gland, at the other an anther. This circumstance distinguishes the genus from all others, and is called its essential character."

In the second order, DIGYNIA, plants with two pistils, there are only three genera, and they are properly grasses.

In the third order, TRIGYNIA, that is, plants with two stamens and three pistils, there are only two nearly allied genera, namely, the pepper and *peperomia*. The first is universally used as a spice; it is extensively cultivated in India, and is a most important article of commerce. Even the leaves of *Piper Betel* are a necessary of luxury, if not of life, in India, being used to chew along with the betel-nut of that country.

The distinctions of this class and its orders will be rendered more intelligible by a reference to the preceding engraving.

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### THIRD CLASS: TRIANDRIA.

ALL flowers having three stamens are found here. It contains three orders, comprising two hundred and seven genera and one thousand five hundred and forty-nine species. The plants arranged here are of the most interesting character. They form the general verdant covering of the earth, affording pasturage for our flocks and herds at almost all seasons, and fodder when the fields are buried in snow. Almost all the useful plants, significantly called *cereals*, are found in this class; the "staff of life," and all the different sorts of grain which serve to feed and to fatten the animals which serve for our "sport or gust," are derived from one or other of the triandrous class. In bulk the grasses are so diminutive as aggregately to form the most compact carpet-like turf; and on the other hand, on the banks of lakes and rivers they grow up into impenetrable reedy thickets. Nor are the other genera ranked here less remarkable for the beauty of their flowers than are the cereals for their usefulness. The well-known crocus, the corn-flag and iris, and many allied foreign genera, are among the chiefest ornaments of our gardens, and which compensates in some measure for their want of usefulness when compared with their associates the cereals. No class shows more decidedly the artificial character of the Linnean system than this; for assuredly the iris and wheat can claim no congeniality with each other, either in external structure or constitutional properties; but these having each three stamens compelled the author to place them together.

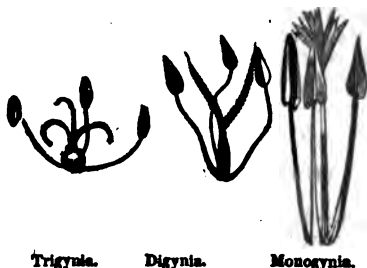
The class is divided into three orders, MONOGYNIA, DIGYNIA, and TRIGYNIA, the first having one pistil, the second two, and the third three.

## CLASS TRIANDRIA.

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The second order, **DIGYNIA**, contains most of our common grasses, as millet, panic grass, bent grass, fox and cats' tail, oat and cocks'-foot grasses, besides wheat, barley, &c., together with the far-famed sugar cane, that

### Triandria.



source of wealth to the tropical planter, and indispensable condiment in the diet of all nations.

The third order, **TRIGYNIA**, contains only twelve genera, most of them are water annual weeds: some are curious or pretty, but none are cultivated out of botanical collections.

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## FOURTH CLASS: TETRANDRIA.

It contains all plants having four stamens of *equal length*. This distinction should be specially kept in mind by the student, because the fourteenth class (*didynamia*) has also four stamens, but in this last two are longer than the others

This class is divided into three orders, namely, **MONOGYNIA**, **DIGYNIA**, and **TETRAGYNIA**, according to their number of pistils respectively. The

### Tetrandria.



whole contains above one hundred and nineteen genera, and one thousand and twenty-seven species in the recently published lists. Many of the genera of the first order are beautiful shrubs and trees, chiefly natives of the Cape of Good Hope and New Holland.

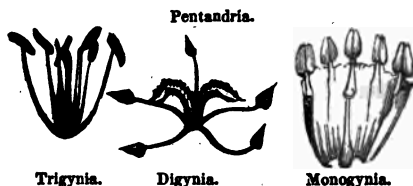
The witch-hazel, one of our most interesting shrubs, is also placed in this small order.

The third order, *TETRAGYNIA*, is also small, containing only eleven genera. Among these, however, we find the well-known holly, or holme-tree, as it used to be called in former times. The common pond-weed, *Potamogeton*, so frequent in our slow-running rivers, also belongs to this order.

#### FIFTH CLASS : PENTANDRIA.

THE flowers of this class have five stamens. It is divided into six orders. This class contains, perhaps, more phænogamous plants than any other in the sexual system. The first order, *MONOGYNIA*, is particularly abundant both in genera and species; every description of flowering plant is found here, trees, shrubs, and herbs, terrestrial and aquatic, trailers, creepers, and climbers, annuals, biennials, and perennials, deciduous and evergreen, tender and hardy.

The second order, *DIGYNIA*, contains all plants having five stamens and two pistils. This is also a large order, and comprises many beautiful and useful plants. Here we find the *Asclepias*, with its curiously constructed flowers, and the no less remarkable *Stapelia*, a family of leafless plants, but bearing flowers of uncommon character both in shape and color, and moreover diffusing a scent so loathsome that blow-flies lay their eggs on the petals!



The third order, *TRIGYNIA*, having three pistils. The laurustine is one of the most ornamental, and the elder, though a common intruder, is nevertheless useful in many respects. The sumach family, so variously useful in the arts, is also ranked here, with several other genera of inferior note.

## CLASS HEXANDRIA.

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The fourth order, **TETRAGYNIA**, having four pistils, contains one genus only, a beautiful inhabitant of our bogs and marshy ground, known by the name of grass of Parnassus. There are four species of this plant already described ; three of them are natives of North America.

Pentandria.



Pentagynia.

Tetragnia.

The fifth order, **PENTAGYNIA**, having five pistils, contains nineteen genera, among which we find the highly ornamental family of *Crassula*, a tribe of succulent plants, chiefly from the Cape of Good Hope. Here also we find the superlatively useful flax, which furnishes the raw material of the linen manufacture ; the neat thrift, used for the edgings of walks in gardens, and the showy sea lavender.

The sixth and last order, **POLYGYNIA**, that is, having many pistils, is a small order containing only three genera, two of which are exotica, the other is the *Myosurus minimus*, or mouse-tail.

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## SIXTH CLASS : HEXANDRIA.

THIS class is divided into four orders, namely, **MONOGYNIA**, **DIGYNIA**, **TRIGYNIA**, and **POLYGYNIA**. It contains two hundred genera, and above one thousand seven hundred and twenty-seven species, including by far the greater number of our bulbous, flowering, and culinary plants, as the showy

Hexandria.



Trigynia.

Digynia.

*nerissus*, the splendid lilies, the long-lived American aloe, the magnificent *erinums*, and *pancratiums*; the unequalled fruit of the pine-apple, and the equally useful onion, asparagus, &c. &c. The plants are chiefly herbaceous, and found in every clime from the torrid to the arctic zone, in the burning sands of Africa, and from under the snows of Siberia. The first is by far the largest order, containing nine tenths of the whole class.

The second order, *DIGYNIA*, contains only three genera, but one of them is most important to the inhabitants of tropical countries, and to those of the warmer parts of the temperate zones. Rice is the staff of life in India, and is cultivated on every spot of level ground where there is a command of water for irrigating the crop. Its quality as a grain is highly nutritious, and at the same time easily prepared for use. A wooden pestle and stone mortar only is necessary to free it from its rough husk; and when winnowed, simple boiling with the addition of a little salt prepares it as a principal article of food for both rich and poor.

The third order, *TRIGYNIA*, contains a few bulbous and tuberous stemmed plants, among which is the well-known dock.

The fourth order, *POLYGYNIA*, comprises only four genera, among which we find one of the most beautiful genera, namely, the water-plantain. It is only found in pools or tarfy bogs.

In studying the plants of this class, care must be taken not to confound them with those of the fifteenth class (*Tetradynamia*), which also has six stamens. The distinction is this: in *Hexandria* the stamens are of equal length, whereas in the fifteenth class four are longer than the other two. But besides, the structure of the flowers of this latter class sufficiently distinguish them from the former.

## SEVENTH CLASS: HEPTANDRIA.

It contains four orders, which together comprise fifteen genera and forty-eight species.

### Heptandria.



Digynia.

Monogynia.



The first order, *MONOGYNIA*, having flowers with seven stamens and only one pistil, contains two nearly allied genera of trees, viz., the *vesculus* and *pavia*, better known by the name horse-chestnut. They are among the most ornamental of our forest trees, though they are not native foresters. The flowers of the common sort are well known, and one or two of the *pavias* have bright red flowers, which are most striking objects in ornamental scenery. The common horse-chestnut yields great crops of nuts; but except the deer, no other animal will touch them.

The second order, *DIGYNIA*, plants having seven stamens and two pistils, contains only one genus, namely, the *Limon Africanum*, a perennial herb from the Cape of Good Hope.

The third order, *TETRAGYNIA*, having four pistils, comprises only two genera, *Saururus*, lizard's-tail, and *Astranthus*, a new genus lately introduced from China.

The fourth order is *HEPTAGYNIA*, that is, plants having seven stamens and seven pistils. It is remarkable that among above three thousand genera, only one should occur with seven stamens and seven styles; indeed, as



Heptagynia.

Tetragynia.

Rousseau remarks, nature has neglected the number seven in her arrangement of vegetable structure.

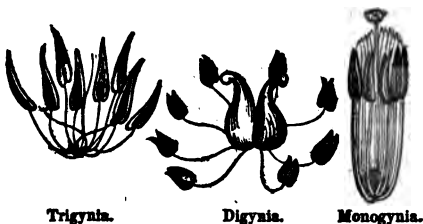
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#### EIGHTH CLASS : OCTANDRIA.

ALL plants having eight stamens are contained in this class, which is divided into four orders containing seventy-seven genera, and one thousand and fifty-nine species. The first order, *MONOGYNIA*, having one pistil, contains many genera; of those the heaths are the most conspicuous and numerous. Of this family alone there are five hundred and forty-three species already described, chiefly natives of the southern parts of Africa. A few are found in Britain, and several in other parts of Europe. The curious *Rhexia*, the gay and night-flowering *Oenothera*, and the elegant *Fuchsia*, are

found in this class. So also is the well-known mezereon, and many exotic genera of great beauty.

Octandria.



Trigynia.

Digynia.

Monogynia.

The second order, DIGYNIA, contains only five genera, all exotics. They have eight stamens and two pistils.

The third order, TRIGYNIA, having three pistils, comprises nine genera, among which the sea-side grape, and soap-berry of the West Indies, are the most remarkable.

The fourth order, TETRAGYNIA, contains six genera, having four pistils, among which is the curiously organized *Bryophyllum* which bears viviparous progeny on the edges of its leaves. This is a remarkable departure from the



Tetragynia.

usual way in which plants produce viviparous offspring. Bulbs send forth offsets from the radical plate or collet; some few from the axils of the leaves on the stem, as exemplified in the tiger lily; others again eject *living* seeds from their spathes, as some of the onion tribe; many trees and shrubs send up suckers from their roots, which become perfect plants; but in the case of the *Bryophyllum*, young plants are produced from the vascular parts of the edges of the leaves, besides yielding seed from their flowers. This mode of reproduction obtains in a few other plants, as the *Malaris* and *Echeveria*; but the leaves of these last require to be laid on moist earth in order to induce

the development of their incipient buds, whereas the first puts them forth in the open air, and while the leaves are in vigorous growth on the branches.

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NINTH CLASS : ENNEANDRIA.

THE plants placed in this class are all furnished with nine stamens, and contain but a limited number of species. It is divided into three orders,

Enneandria.



Monogynia.

comprising together, ten genera and seventy species. The first order, **MONOGYNIA**, contains plants having nine stamens and one pistil; in it we find the useful and fragrant cinnamon, and the famous genus laurel, whence so many medicinal oils, and other useful substances are extracted.



Hexagynia.



Trigynia.

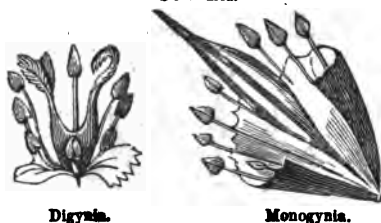
In the second order, **TRIGYNIA**, or plants with nine stamens and two pistils, we find the excellent medical and now culinary plant rhubarb.

The last order is **HEXAGYNIA**, or plants with six pistils: it contains but one genus of which there are only two species, the flowering-rush of Britain and the broad-leaved rush from Nepal.

## TENTH CLASS : DECANDRIA.

THE tenth class is divided into five orders, all having ten stamens ; it contains one hundred and eighty-six genera, and above one thousand six hundred and forty-eight species. This class comprises a great many of our finest flowering shrubs and trees. In the first order, *MONOGYNIA*, we have

Decandria.



Digynia.

Monogynia.

the *Kalmias*, *Ledums*, *Rhododendrons*, *Andromedas*, &c., plants as generally admired as they are universally cultivated : we have also the arbutus, clethra, the fine aromatic scented storax tree, and many other exotics of the greatest beauty, all having one pistil only.

In the second order, *DIGYNIA*, we find the well-known *Hydrangea*, the extensive genus *Saxifrage*, and the equally extensive family of *Dianthus*, which includes the highly estimable carnation, pink, sweet-william, and other species and varieties of that favorite tribe ; these have two pistils.

The third order, *TRIGYNIA*, contains a great many plants which are allied to the *Dianthus* family. They are mostly slender annual weeds, though many are pretty and a few ornamental. The catchflies, stitchworts, and sandworts are all found here, and constitute a great majority of the order ; they have three pistils.



Decagynia.

Pentagynia.

Trigynia.

The fourth order, *PENTAGYNIA*, contains a good many plants, both native and foreign. The *Cotyledons* and *Oxalises* of the Cape of Good Hope,

and the *Sedums* of Europe, are most numerous. The lychnis and mouse-ear chickweed, together with the common spurrey, and other plants having five pistils, are also placed here.

The fifth order, DECAGYNIA, that is, plants having ten pistils as well as ten stamens, contains only one genus, and that a foreigner, namely, *Phytolacca*, of which there are nine or ten species.

## ELEVENTH CLASS : DODECANDRIA.

THERE is no plant yet discovered with eleven stamens, and all those of this class vary from twelve to nineteen. It contains seven orders, forty-nine genera, and four hundred and twenty-four species. The first order, Mo-

Dodecandria.



Trigynia.

Digynia.

Monogynia.

NOGYNIA, among many fine tropical plants, includes the celebrated fruit tree, mangosteen, said to be the most delicious and wholesome fruit in the world.

The second order, DIGYNIA, having two pistils, contains only two genera, of which agrimony, common on road-sides, is one.

The third order, TRIGYNIA, contains the genus *Reseda*, some species of which are used by the dyer for producing a yellow color: another species is the universal favorite, mignonette, cultivated entirely for its scent. The extensive *Euphorbia*, or *spurge* family, also belong to this order.

The fourth order, TETRAGYNIA, having four pistils and thirteen stamens, contains only one genus, viz., the *Calligonum pallasia*, a native of the Caspian

The fifth order, PENTAGYNIA, plants with five pistils, contains only three genera, of which the *Blackwellias* are the principal. They are all, except one, tropical shrubs.

The sixth order, **HEXAGYNIA**, contains a single genus, viz., *Cephalotus*, but that a very curious one; its leaves being formed into elegant pitchers, furnished with lids, like those of the *Nepenthes*.



Pentagynia.



Tetragnia.

The seventh and last order, **DODECAGYNIA**, contains only two nearly allied genera, viz., the sempervivum or house-leek, having twelve pistils and twelve stamens.



Dodecagnia.

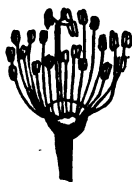
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#### TWELFTH CLASS : ICOSANDRIA.

THIS class contains all such plants as have twenty or more stamens seated upon the corolla or calyx. In this class the situation and not the number of the stamens furnish the characters of the class; they are also remarkable for rising directly from the calyx along with the corolla; the calyx is of one leaf and hollow. It is divided into three orders, comprising sixty genera, and one thousand two hundred and ten species. This is one of the most important classes of the Linnæan system, as containing many of our most useful fruits,

as well as most esteemed flowers. In the first order, **MONOGYNIA**, having one pistil and twenty or more stamens, we have the gorgeous *Cacti*, *Cereus*,

Icosandria.



Monogynia.

*Epiphyllum*, and *Opuntias*; the myrtle, *Eugenia* and *Eucalytus*; these plants are all remarkable for a structure different from most other plants, and many of them are esteemed for the beauty of their flowers. Of fruits we have the guava, pomegranate, and several of our best wall-fruits.

In the second order, **DI-PENTAGYNIA**, that is, plants having from two to five pistils, we have the pear, apple, quince, &c.; likewise the extensive genus *Mesembryanthemum*, of which there are three hundred and thirteen species, besides numerous varieties described by the late lamented Mr. Haworth.



Polygynia.



Di-Pentagynia.

In the third order, **POLYGYNIA**, we have the unrivalled rose, the exquisite strawberry, raspberry, and many others of great worth and beauty.

THIRTEENTH CLASS : POLYANDRIA.

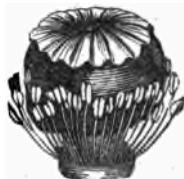
ALL plants having an unlimited number of stamens distinct from each other, and seated on the receptacle, belong to this class, which contains one hundred and seven genera, and nine hundred and fifty-six species.

The first order, *MONOGYNIA*, having one pistil, comprises, among many others, the caper-tree, the well-known poppy, the curious *sarracenia*, and the magnificent water-lily. To this order also belongs the *Bixa orellana*, the red pulp of which is extensively used by dyers under the name of *arnotta*.

Polyandria.



Di-Trigynia.



Monogynia.

The second order, *DIGYNIA*, is well typified in the splendid peony, a genus which has been lately much increased by new varieties received from China and Siberia. The plants of this order have two pistils.

The third order, *TRIGYNIA*, contains the beautiful larkspurs, the dangerous aconite, and the strong-scented *Hibbertia*.

The fourth order, *TETRAGYNIA*, contains only two genera; the butter nut, a tropical fruit; and the *Drimys winteri*, a tree allied to the magnolia.

The fifth order, *PENTAGYNIA*, contains ten genera, of which the well-known columbine may be taken as a type.



Polygynia.



Pentagynia.

The sixth order, *POLYTRIGYNIA*, contains a great many fine flowering plants, both shrubs and herbs; among the former, the magnolia is most conspicuous; among the latter, the anemone and ranunculus are confessedly beautiful. Of early, or winter flowering plants, the aconite and hellebore are examples, and the globe-flower and marsh-marigold are showy plants.



## FOURTEENTH CLASS: DIDYNAMIA.

THE flowers of this class have four stamens, two of which are superior, and it contains two orders, one hundred and seventy genera, and one thousand four hundred species. The flowers are generally ringent.

In the first order, *GYMNOSPERMA*, the calyx is persisting, and becomes the seed-vessel, in which the seeds lie naked. In this order we find the germander, lavender, mint, and dead-nettle, and many others of similar character: several of them are useful in cookery.

## Didynamia.



Angiosperma.



Gymnosperma.

The second order is *ANGIOSPERMA*, so called because, though the stamens are the same in number and position, the seeds are differently disposed, being contained in a capsule. Many of the plants in this order are very beautiful; for instance, the bignonia, volkameria, antirrhinum, mimulus, &c. The common fox-glove, so conspicuous in our hedge banks, also belongs to this order, and is a good type of the whole.

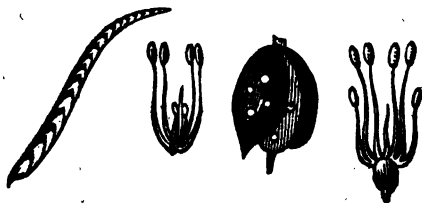
This class, with its orders, are easily distinguished from the fourth class, which also has four stamens; but the characters are very striking, and cannot easily be mistaken for those of the fourth. In this the calyx is of one leaf and tubular, divided into five or two-lipped segments, which are unequal and persisting. The corolla is of one petal; the upper lip concave and sometimes bifid, the lower lip trifid.

The seeds in the first order are four, situate at the bottom of the persisting calyx. In the second order they are numerous, and fastened to a filiform receptacle.

## FIFTEENTH CLASS : TETRADYNAMIA.

THIS class has six stamens, four of which are longer than the other two. There are no orders in this class, the orders *siliculosa* and *siliquosa* being exploded, all the flowers being similar in structure, and is a truly natural association, and forms the order *Cruciferae* in Jussieu's system. Many of the

Tetradynamia.



Stamens and seed-vessels.

plants are dietetic, as the cabbage, turnip, radish, &c. ; and some are finely scented and favorite flowers, as the wall-flower, stock, arabis, rocket, &c. The seeds of several cruciferous plants yield oil of excellent quality.

This is a truly natural class of plants, great similarity of the flowers, seeds, &c., being observable throughout the whole of the genera. The calyx is a four-leaved perianthemum, sepals concave, equal, and deciduous ; corolla of four petals, claws inserted into the receptacle, limbs widening outwards, and assuming a cruciform direction ; stamens six ; filaments awl-shaped, the opposite ones shorter than the other four ; anthers acuminate, often arrow-head shaped, diverging ; pistillum germen superior, style short or wanting ; stigma obtuse ; seed-vessel is a siliqua or silicula, of two valves opening at the base. The stigma is commonly persisting, and forms the apex of the dissepiment, which is prominent beyond the margins of the valves.

Linnæus divided this class into two orders, founded on the shape of the seed-vessels, one being a short roundish pod, and the other a long one, as represented in the cut. But as these forms often approach each other among the genera, modern writers have discontinued noticing the orders, as the distinctions were specific rather than generic.

## SIXTEENTH CLASS : MONADELPHIA.

THE stamens are united in one set in this class, which is divided into seven orders, founded on the number of the stamens, not on that of the pistils, as in other classes ; the whole containing one hundred and thirty-nine genera, and one thousand four hundred and thirty-six species.

## Monadelphia.



Octandria.

Heptandria. Pentandria. Triandria.

The first order, TRIANDRIA, contains all such flowers as have three united stamens. In this we find several beautiful Cape bulbs ; as the *Ferraria*, *Tigridia*, *Herbertia*, &c. The flowers are not only of uncommon forms, but curiously spotted or streaked with dark colors.

The second order, PENTANDRIA, has five stamens united in one set. Of this order the passion-flower is the most remarkable type.

The third order, HEXANDRIA, has six stamens united in one set. This order contains but one genus, and is so distinct in itself, that it forms an order in the natural system. It is a bulbous-rooted plant, called *Gilliesia graminea*, having grass-like leaves and curious flowers. This plant was unknown to Linnæus.

The fourth order is HEPTANDRIA, plants furnished with seven stamens united together at the base. The order contains the pelargoniums, commonly called geraniums ; a genus of plants unequalled for immense variety of forms and colors. Of pelargoniums there are above two hundred and thirty-eight species, and between three and four hundred varieties already enrolled in books. They are chiefly natives of the Cape of Good Hope, and have long formed a large majority of our green-house plants.

The fifth order of the class is OCTANDRIA, and contains only two genera, which have eight stamens united in one set or brotherhood. The first genus is *Aitonía*, named by Linnæus in honor of the late William Aiton, Esq., royal gardener at Kew, England. The second is *Comosperma*, hairy-seeded shrubs from New Holland.

The sixth order is DECANDRIA, plants having ten stamens in one set. Here we find the true geraniums or crane's-bill. These are chiefly herbaceous plants, and found in many parts of the temperate latitudes. The herb Robert, is a common British plant, and is a good type of the genus. This

## Monadelphis.



Polyandria.



Dodecandria.



Decandria.

order is, however, rich in showy plants of very differently constructed flowers, called *Papilionaceus*, or butterfly-shaped, and their seed-vessels being pods.

The seventh order is **DODECANDRIA**, containing plants which have twelve stamens in one brotherhood. This order comprises twelve genera, some of them highly ornamental, but they are all tropical plants.

The eighth order is **POLYANDRIA**, that is, flowers having many stamens united in one set. Here many of our gayest flowering plants are arranged — as the althea, lavatera, hibiscus, sida, silk-cotton-tree, the tea-tree, and its



Adansonia.

magnificent congener the camellia, now so common an ornamental favorite in British gardens. All the orders of this class are rich in fine flowering plants; and as a great majority of them were easily transported from the countries in which they were natives, a chief part of them has been long in cultivation in European collections. In *Malvaceæ* there are many splendid plants, and only equalled by many of the *Bombaceæ*, the *Ternstromaceæ*, *Camelliaceæ*, and *Myrtaceæ*. In short, there are here an assemblage of beauties which are scarcely to be surpassed by any equal number of orders in the whole vegetable kingdom. For whether we consider those that are herbaceous, as the hollyhock; or shrubby, as the camellia; or climbers, as the passion-flower; or as stately trees, as the *Adansonia* and silk-cotton, few of the same descriptions of plants can be found to compare with them in floral grandeur.

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#### SEVENTEENTH CLASS : DIADELPHIA.

Flowers having two sets or brotherhoods of stamens. In general nine are united together, with a single one by itself, which is accounted the second brotherhood. This class contains one hundred and twenty-nine genera, and one thousand five hundred and six species. The flowers are chiefly butterfly-shaped, and the whole class has a very distinct character.

Diadelphia.



Hexandria.



Pentandria.

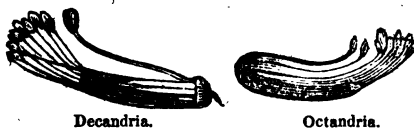
The first order is **PENTANDRIA**, that is, five stamens united in two sets. This order contains only a single genus, namely, the *Monniera trifolia*, an African Annual of no great beauty.

The second order is **HEXANDRIA**, consisting of plants bearing six stamens in two brotherhoods. This order contains six genera, of which the common weed fumitory is a good example.

The third order of this class is **OCTANDRIA**, containing flowers having eight stamens in two sets. This order comprises only four genera, of which the beautiful milkwort is the most numerous and conspicuous.

The fourth order **DECANDRIA**: plants having ten stamens united in two sets, usually nine together, and one by itself above the others. The order

## Diadelphia

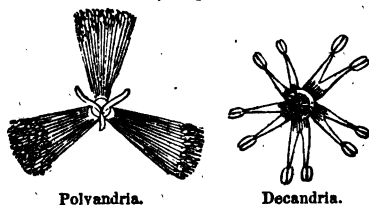


contains the greater number of the leguminous plants, or such as bear pods. They have all butterfly-shaped flowers ; and comprise almost all our most useful kinds of pulse, forage plants, dyes, and many beautiful and valuable shrubs and trees. The pea, bean, tare, indigo, are examples of the order.

## EIGHTEENTH CLASS : POLYADELPHIA.

It contains all plants having their stamens arranged in many brotherhoods. It is divided into two orders, and contains twenty-one genera and one hundred and eighty-seven species.

## Polyadelphia.



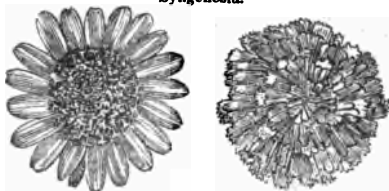
The first is DECANDRIA ; flowers with ten stamens in several distinct bundles or sets. Here are only four genera, all tropical plants ; among them we find the *Theobroma*, which yields the useful chocolate nut.

The second order is POLYANDRIA, comprising plants whose flowers have many stamens in many distinct sets. This disposition of the parts on which the order is founded, is exemplified in the St. John's wort, a plant common in our fields as well as gardens. And in green-houses the useful and beautiful fruit-tree, the orange, affords a ready example.

## NINETEENTH CLASS : SYNGENESIA.

THIS class contains all the compound flowers, or *Compositæ* of Jussieu. The meaning of the title signifies to generate together : the seed-bearing florets being all crowded together on the same base or receptacle : or, more probably, from the circumstance of the stamens being united in a cylinder, and surrounding the style near its apex. The peculiar arrangement by which syngenesious flowers are distinguished from all others is this, that besides the union of the anthers, the flowers or florets, instead of standing singly, are here congregated ; instead of each having a calyx and receptacle, one calyx and one receptacle is common to the whole, whatever that number may be. The whole together is called the flower, as that of a daisy : the separate parts composing the disk of it, are called florets. The flower is supported on its exterior by a number of scale-like leaves, by some called calyx, but by others *anthodium*, and mostly attached to the outer rim of the receptacle, which bears the florets on its upper surface. The florets however are not always perfect in themselves ; some of them are of two sexes, others, male, or female, or neuter. On the difference of these in position and character, the orders of the class are founded. The florets are said to have a calyx which is superior, and becomes the crown of the seed ; a corolla which is of one petal and superior ; the limb campanulate, or ligulate ; stamens five, filaments inserted into the tube of the floret ; anthers united by their margins in all bisexual florets ; germen inferior, being a naked seed crowned with the other parts ; style erect ; stigma in two parts, each revolute and divergent ; seed single, either naked, or crowned with the calyx, or with a pappus to assist the dispersion. The dandelion and thistle are familiar examples. This class contains two hundred and seventy-seven genera, and two thousand six hundred and fifty species.

Syngenesia.



Superflua.

Æqualis.

The first order is *ÆQUALIS* in which all the florets are of two sexes. This is a very extensive order, and contains many very common plants, as the sowthistle, lettuce, hawkweed, burdock, artichoke, &c., &c. The chief part of them are herbs, and many are annuals.

The second order is **SUPERFLUA**. Here we find plants the flowers of which have the florets of the disk bisexual, and those forming the rays female, but which are impregnated by the anthers of the disk. This circumstance was considered by Linnæus as superfluous, and hence the title. This is also a very large order, and contains many useful as well as beautiful plants. Of the first, tansy and camomile are examples; of the second, the helichrysums, xeranthemums, and dahlias.

The third order is **FRUSTRANEA**, so called because the florets of the disk are bisexual, and those in the ray or margin neuter. These last, having sometimes the rudiments of a pistillum, but no other sexual organ, are said to be ineffectual or frustrated polygamy. The type of the order is the splendid sunflower, with which many of the same style of flowering plants are arranged, such as the rudbeckia, coreopsis, &c.

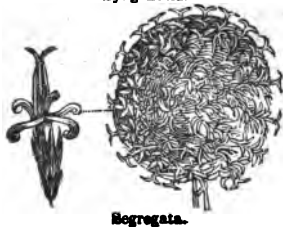
**Syngenesia.**



The fourth order is called **NECESSARIA**, because the florets of the disk or centre of the flower, being all male, it is necessary that those of the ray or margin should be female, in order that there may be perfect seed, and which is found to be the case in all plants ranked in this order. Calendula and arctotis, exotics chiefly from the Cape of Good Hope, are two of the most conspicuous genera in this order.

The fifth order of Syngenesia is called **SEGREGATA**, because the florets

**Syngenesia.**





have each its proper calyx (different from the perianthe of the floret), besides the common anthodium or exterior calyx; or there are several florets contained in each calyculus. All the plants in this order are exotic herbs and under shrubs.

To the above five orders Linnæus added a sixth, called *MONOGAMIA*, in contradistinction to the other orders which are polygamous. The plants which stood in this sixth order were such as had their stamens united, as in the other orders of the class, but had simple flowers, not aggregated florets. The genus *Lobelia* was one, but which is, as well as all the others (except one) of the order *Monogamia*, now placed in the class *Pentandria Monogynia*.

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#### TWENTIETH CLASS : GYNANDRIA.

It contains plants which have their stamens seated upon the pistillum. This class comprises one hundred and ten genera, and four hundred and thirty-seven species. The species are generally herbaceous, with tuberous roots, curious gouty, or climbing stems; many are epiphytes growing on trees, or flourishing in rotten vegetable matter in moist places. Some of their flowers are splendid, many highly fragrant, and all of remarkable conformation. The class is divided into three orders, viz. : —

##### Gynandria.



Hexandria.

Diandria.

Monandria.

Order one is *MONANDRIA*, containing plants which have one anther seated on the pistillum. This order comprises some of our most attractive wild plants.

The second order is *DIANDRIA*, flowers having two anthers seated on the pistillum. In this order we find the beautiful ladies' slipper.

The third order is *HEXANDRIA*, containing plants which have six stamens seated on the pistil.

### TWENTY-FIRST CLASS : MONŒCIA.

It consists of plants which have male and female flowers separate, but on the same root. This class contains one hundred and forty-seven genera, and one thousand and fifty-two species. It may here be observed, that in syngenesious flowers the unisexual florets stand separately, but are included in the same cover ; here they also are separate, but in distinct covers.

Monœcia.



Diandria.



Monandria.

This class is divided into ten orders, viz. : —

The first order **MONANDRIA**, that is, separate male flowers bearing one stamen. Five genera are contained in this order, one of which is the celebrated bread fruit tree, a native of the South Sea Islands.

Monœcia.



Triandria.

The second order is **DIANDRIA**, having distinct male flowers bearing two stamens. In this order is found the common duckweed.

The third order is **TRIANDRIA**, consisting of plants having separate male flowers bearing three stamens. The maize or Indian corn ranks in this order.

The fourth order is **TETRANDRIA**, includes all plants whose separate male flowers have four stamens. Here we find the alder and birch, forest trees; the box and mulberry trees.

The fifth order is **PENTANDRIA**, containing all monœcious plants whose male flowers bear five stamens. The amaranthus is most conspicuous here.

The sixth order is **HEXANDRIA**, separate male flowers, furnished with six stamens. The plants of this order are chiefly palms, or allied to that tribe. The cocoa nut and sago palms are here, as well as the acrocomia and others.

The seventh order, **OCTANDRIA**, has separate male flowers, bearing eight stamens. This is a very small order, containing only one genus, the *Duvaua*, a lofty tree, indigenous to Chile. There are two species, one of them from *Ouhyhee*.

**Monœcia.**



**Pentandria.**

**Tetrandria.**

The eighth order is **ICOSANDRIA**, containing plants which have male flowers separate, and bearing many stamens inserted into the calyx. Botanists have as yet discovered only one genus which can with propriety be placed here, and this a tree from New Holland, called *Atherosperma moschata*.

**Monœcia.**



**Polyandria.**

**Hexandria.**

The ninth order is **POLYANDRIA**, which contains plants whose male flowers are separate, and which bear many stamens, seated on the receptacle.

This is a pretty large order, and comprises the beautiful *Begonia*, the chestnut, beech, hazel, walnut, and above all, the lordly oak. Here also we find the plane tree, *Salisburia*, and the humble yet numerous tribe of arums.

**Monœcia.**



**Monadelphis.**

The tenth order is **MONADELPHIA**, that is, plants having male flowers distinct, and whose stamens are united at the base into one brotherhood. This is the largest order of the class, and contains some of the most magnificent forest trees, as the pines and firs, larch, cedar, cypress, &c. Here are also the enormous gourd, useful melon, and cucumber, the poisonous *janipha manihot*, and the medicinal *palma Christi*.

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**TWENTY-SECOND CLASS : DICECIA.**

It is composed of plants which have unisexual flowers, not on the same but on different roots. In modern nomenclatures this class has arranged in it one hundred and three genera, and six hundred and sixty species. It is divided into no less than thirteen orders, which are as follows, viz. : —

The first order is **MONANDRIA**, consisting of plants bearing unisexual

**Dicecia.**



**Diantria.**

**Monandria.**

flowers on different roots, those of the male plant having but one stamen.

This is a small order, containing only two genera, one being the remarkable screw-pine ; so called because the leaves resemble those of the pine apple, only much larger, and they issue from the stem in a very different manner ; that is, neither opposite or alternately, but the last always a little to the left of the former, so that they are expanded spirally like the worm of a screw.

The second order is DIANDRIA, containing plants having unisexual flowers on different roots, the males bearing two stamens. This order contains four genera, of which the common willow is the principal ; there being of this genus no less than one hundred and sixty-seven species already described. The *Valisneria spiralis*, so beautifully described by Dr. Darwin in his " Loves of the Plants," belongs to the order.

Dicecia.



Tetrandia.

Triandria.

The third order is TRIANDRIA, having male flowers on one plant, and females on another, the former being furnished with three stamens in each. This order contains twelve genera, among which one is a common trailing plant, found on our moist moors—namely, the crow-berry. The date-bearing palm, so useful to the common people in Persia, and other countries where it grows naturally, also belongs to this order.

The fourth order, TETRANDRIA, consists of plants having flowers of one sex, but on distinct roots. The male plants have four stamens in each flower. This order contains fifteen genera, among them we find the candle-berry myrtle.

The fifth order is PENTANDRIA, the male plants of which bear flowers having five stamens. This order contains thirteen genera : among which are the well-known culinary vegetable spinach, and the no less valuable hop. All the other genera are exotics. Respecting the hop, it has been said that it was formerly the custom to root out all the male plants from every hop-garden ; but that now the custom is found erroneous ; and one male plant to every twenty females is allowed by the growers, in order to give weight to the sample.

Diœcia.



Hexandria.

Pentandria.

The sixth order is **HEXANDRIA**, diœcious plants, bearing male flowers, having six stamens. This order comprises seventeen genera, among which are six palms, some of them of stately growth, and highly ornamental in their native countries. The genus *smilax* is also here, some of the species of which yield medical drugs.

Diœcia.



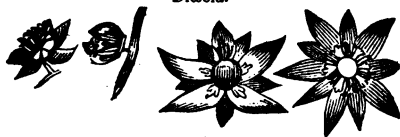
Enneandria.

Octandria.

Order seven is **OCTANDRIA**, containing diœcious plants, the males of which have flowers furnished with eight stamens. This is a very small order, containing only the genus poplar.

The eighth order is **ENNEANDRIA**, the male plants of which bear flowers having nine stamens. This is also a small order, containing only three genera.

Diœcia.



Dodecandria.

Decandria.

The ninth order is **DECANDRIA**, the male plants of which have ten stamens. Another small order, containing five genera, all of which are

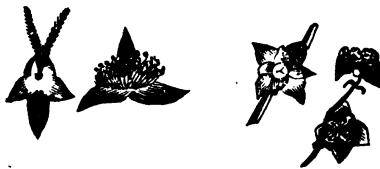
exotics. One of the principal is the papaw, a large tree-like herb, bearing bunches of fruit resembling melons, much used in India.

The tenth order is **DODECANDRIA**, the male plants of which are furnished with twelve stamens. This order contains six genera.

The eleventh order of the class **Diœcia** is **ICOSANDRIA**, the male plants of which bear flowers having above twelve stamens inserted in the calyx.

Order twelve is **POLYANDRIA**, the male plants of which are furnished with many stamens, fixed on the receptacle. This order contains seven

Diœcia.



Polyandria.

Icosandria.

genera, all of which are exotics. Here we find *Cliffortia*, a genus common in our green-houses. Also *cycas* and *zamia*, plants of curious habit, to be met with in most collections.

The last order of the class is **MONADELPHIA**, the male plants of which bear flowers, in which the stamens are united in one brotherhood. This

Diœcia.



Monadelphia.

order comprises fifteen genera, of very various bulk and manner of growth. Here are the magnificent Bourbon palm, the lofty and symmetrical araucaria, — the humble butchers' broom — the pyramidal juniper — the dark yew — the fragrant nutmeg, and the curious pitcher plant, forming together a most interesting assemblage.

## TWENTY-THIRD CLASS : POLYGAMIA.

SIGNIFYING many marriages; that is, of plants having both unisexual and bisexual flowers on the same, or on different roots. There is a good deal of uncertainty about placing plants in this division of the system, because some of the genera are not always constant in their modes of flowering; and even single plants will occasionally exhibit all the characters by which the different orders are founded.

This class contains sixty-eight genera, and seven hundred and thirty-six species, and is divided into two orders.

## Polygamia.



## Monœcia.

The first order is **MONŒCIA**, containing plants in which the polygamy is complete on one root, that is, where there are male flowers having stamens only, female flowers having pistils only, and flowers in which the stamens and pistils are united. This is a very extensive order, and contains many highly beautiful as well as useful plants. Here are the mimosas, the ingas, the acacias, the maples, the beautiful ailantus, and the fine fruit tree, the mango. There are also a good many of the graminæ in this order.

The second order **DICŒCIA** contains plants which have the polygamy complete on two different roots. This order contains eighteen genera, among which there are the ash tree, so useful for its timber, the bread nut, the date plum, the anacardium, and the numerous family of the fig. Out of this last-mentioned genus *Linneus* formed another order which he called **TRIŒCIA**,



## Polygamia.



## Dioecia.

having the polygamy complete on three distinct plants ; that is, male flowers are found on one, female on another, and male and female flowers on a third ; but as this circumstance has only been noticed on one species, viz. the cultivated fig, his followers have thought the order untenable, and it is therefore abolished.

## TWENTY-FOURTH CLASS : CRYPTOGRAMIA.

**SIGNIFYING** hidden marriages. This class is divided into nine orders, and contains three hundred and seventy-six genera, and two thousand six hundred and sixty-two species.

The first order is **FILICES**, or ferns, having the sporule or seed conceptacles on the back of the fronds or leaves. In the *Blechnum*, figured below,

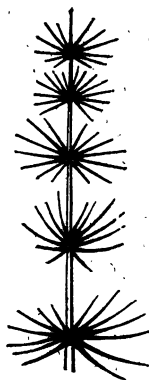
## Cryptogamia.

*Blechnum*.The Gum — *Polypodium*.

the fructification forms lines parallel to the ribs of the leaflets, while the *Polypodium* is so called from the fructification spots on the back of the frond.

These are a very curious and distinct tribe of vegetables. They have perennial roots, annually throwing up stems or fronds, which are evolved circinate; that is, the point of the frond, and its divisions, are rolled in upon their bases in their incipient state, and their development is an evolution or unrolling to complete expansion. In cold countries, the ferns are what the palms are between the tropics, their appearance being somewhat similar. Indeed, some of the ferns in South America vie with the palms in height, though not in duration; the former being much more fugitive. The fronds are kidney-shaped, linear, pinnate, or decomposed; some are not more than an inch in height; others, in warm countries, arrive at many feet in height. According as the conceptacles, or spots whence the seeds or dust proceed, are arranged on the frond, the generic characters are drawn; some, as the *osmunda*, have their fructification in a loose spike, quite different in form from the fronds. The habitat of ferns is on waste ground, damp rocks, or mossy stems of trees.

The second order, *EQUISETACEÆ*, contains only one genus, whence the name of the order is derived, namely, *equisetum*, or horsetail, a common British plant found in pools and ditches. In some countries this plant is called frog-pipe, because frogs are found in the same situations. The horsetail is of most symmetrical growth, having upright jointed stems, with verticillate fringes of linear leaves, bearing spikes of fructification on the summit.



*Equisetaceæ.*

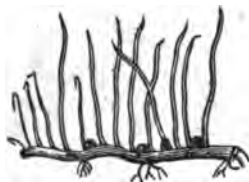
The third order is **LYCOPODEACEÆ**, containing only two genera. This is otherwise called club-moss, from the shape of the plant. The plants of this order are found on peat bogs, and damp woods of peaty soil.

Cryptogamia.



Lycopodeaceæ.

The fourth order is **MARSILEACEÆ**, containing four genera. These are very inconspicuous plants, springing up on moist ground among moss or grass, having the appearance of tufts of small quills; others bear little round heads; hence they are called pillwort.



Pitularia. Marsileaceæ.

The fifth order is **MUSCI**, containing a great many genera and species. These flourish only in cold northern countries, and in shady damp situations.



Musci.

Bogs and moist ground are covered with them, forming a soft and compact carpet. They rank in the lowest order of vegetation, and serve for a protection or food for larger plants.

The sixth order is **HEPATICÆ**, consisting of small creeping inconspicuous plants, having their leaves imbricated on each other, and quite distinct from

the lichens, which they in some degree resemble. One of the genera, the *jungermannia*, is very common, and met with on bogs, moist woods, and sides of mountains where springs ooze out.



*Hepaticae.*

The seventh order is *ALGÆ*, containing seventy-nine genera, which are chiefly aquatic, inhabiting the sea, lakes, and rivers. In the second tribe



*Algæ.*

of this order we find *conferva*, a numerous genus, and remarkable for its being sooner detected by its color than its form. The green scum, which so soon appears on a glass of water, or on the surface of moist earth, or on the inside of water vessels, or on stones in brooks, is *conferva* of one species or other. The greater number of *algæ* inhabit the depths and shallows of the ocean, hence called sea-weeds.

The eighth order is *LICHENES*, containing all those scaly, ash-colored substances which grow on rocks, walls, buildings, or stems of trees. They assume very many forms; some are spread out in thin parchment-like expansions, others rise from the surface on which they grow, and present shaggy tufts of a hoary appearance. Some of them are the food of animals,

*Lichen-rangiferinus.**L. pixidatus.*

*Lichen-rangiferinus* being almost the only provision of the reindeer of Lapland; others are medicinally useful, and a few are used by the dyer. The fruit of the lichens consist of tubercles, or saucer-like bodies; the plants are found on the old branches of trees, wooden pales, &c.

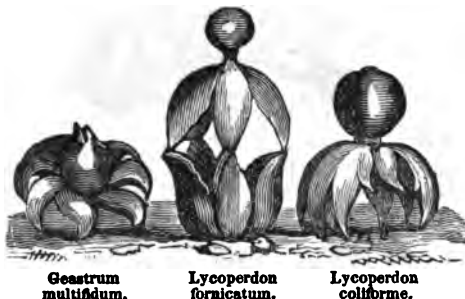
*Lichen.*

The ninth and last order is *Fungi*, comprising all the mushroom tribes. There are above one hundred and fifty-nine genera, and upwards of one

*A. volucaeus.**A. campestris.*

thousand one hundred and fifty-seven species already on the published lists ; and no doubt many more exist undiscovered. The major part of the fungi grow on rotten wood, and other decayed vegetable and animal substances. Some of them are eatable, and much used in refined cookery, others poisonous, and much caution is requisite even in choosing those which are allowed to be wholesome. The dry rot in timber is said to be caused by different kinds of fungi.

In the above figure, the *Agaricus volvaceus* represents a young plant bursting through the volva, and a mature one with its lacerated remains round its base ; the volva, in a few species of the *Lycoperdon* genus, assumes rather a curious and puzzling appearance. Splitting into a number of elastic segments, it turns inside out, and becomes the fulcrum of the fungus, as in *Lycoperdon coliforme*, or sessile, as in *Geastrum multifidum*. But in *Lycoperdon fornicatum*, or turret puff-ball, a still more wonderful appearance is presented ; in this the volva has a kind of inner lining, the habit of the outer is to split like the volva of *Agaricus volvaceus*, the inner as though inflated rebounds upwards, as *Lycoperdon coliforme*, however both split into four corresponding divisions, the points of these divisions remain in contact, and bear the puff-ball on their summit as may be seen in the figure.



To these twenty-four classes the author of the sexual system added an appendix containing the order *Palmae*, the flowers of which, in his time, were not sufficiently known to enable him to place them in the proper classes ; this task, however, has been performed by modern botanists, who have distributed the palms among the different classes and orders according to the Linnean rules, and where he himself would have placed them had he been acquainted with their manner of flowering.

The foregoing is an outline of the sexual system of botany. The annexed

delineations of the numbers and dispositions of the sexual parts on which the system is founded, render longer descriptions of the classes and orders unnecessary. For by an attentive examination of the titles compared with the figures, as perfect a knowledge of the system may be acquired, as is necessary for any one seeking information on the subject.

For the easy classification of the various tribes of plants, the sexual system is as well calculated as any other artificial scheme that can be devised; and as a first step to gaining a knowledge of the different forms of flowers it is indispensable. But like all other artificial systems it has its defects; these are bringing together in the same class, plants which have neither resemblance nor affinity with each other, save in the circumstance of their having the same number of stamens. Some of the true grasses, for instance, are classed with genera having no kind of similitude or congeniality; indeed, many anomalies are found in the system, which show its artificial character. This, as before observed, was felt and acknowledged by the author himself, and has led to the new system of Jussieu.

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# DIRECTIONS

FOR

## PRESERVING PLANTS.

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It is unnecessary to enumerate all the advantages resulting from the possession of a collection of preserved plants, as they can be fully appreciated only by a person who has made considerable progress in the study of Botany. But the beginner requires to be informed, that nothing can more materially aid him in his endeavours to become familiar with the objects which vegetation presents to his view, than such a collection, to which he can at all times refer, either for refreshing his memory, or for instituting a more minute examination than he had previously made. Plants are generally preserved by drying, and a collection of this kind is called a *Hortus siccus*, or *Herbarium*. Various methods are in use for drying plants; but the following, being among the most simple and efficacious, and attended with little difficulty, is here preferred.

The articles necessary for the accomplishment of the object in view are, a quantity of smooth, soft paper, of large size (16 quires perhaps); eight boards of the same size, about an inch thick, of hard wood; four iron weights, or pieces of lead, two of them about forty pounds' weight, the others half that number. Or in place of these weights a number of clean bricks may be used, or, in short, any heavy bodies of convenient form. Along with these articles, a botanical box is necessary. This box is made of tin, and varies in size, from nine inches to two feet in length, according to the taste and avidity of the collector.

In gathering plants for this purpose, such as are smaller than the size of the paper are to be taken up roots and all. In many cases, portions only of plants can be preserved, on account of their size, and then the most essential parts are to be selected, including always the flowers. Plants to be preserved are to be gathered in dry weather, and immediately deposited in the tin box, which prevents their becoming shrivelled by evaporation. If gathered in wet weather, they must be laid out for some time on a table or elsewhere to undergo a partial drying. When roots have been taken up



along with the stems, they ought to be first washed, and then exposed for some time to the air.

Let us now suppose that a dozen specimens are procured. Over one of the boards lay two or three sheets of the paper, on the uppermost of which spread out the plant to be dried, unfolding its various parts, not, however, so as to injure its natural appearance. A few of the flowers and leaves ought to be laid out with particular care. Over this specimen lay half a dozen sheets of paper, on the uppermost of which lay another plant as before, and so on successively, until the whole are disposed of. A few sheets are then laid upon the last, and a board placed over all.

Plants, viewed with reference to drying, may be divided into two classes, the one comprehending those which, being thin, soft, and flexible, require little pressure to reduce them to a level, the other including such as, being stiff and thick, require much pressure. Supposing the above plants to have been of the first class, we lay upon the upper board one of the smaller weights. A series of more stubborn specimens being, in like manner, placed between other two boards, we lay one of the larger weights upon them.

Should more specimens be collected next day, they are disposed of in the same manner; and thus successively. At the end of three days generally, the plants first laid in are to be taken out, together with the paper about them. They are to be laid in fresh paper, three or four sheets being placed between every two plants, and the whole put between two boards, with a weight over them. The second series is similarly treated next day, and so on. The paper from which the plants have been removed is to be dried for future use.

There will thus be four sets of plants: two in the first stage of drying, and two in the second stage. The plants of the second stage sets should be taken out about three days after they have been deposited, and, after dry paper has been put about them, returned to their places. The paper may thus be shifted until the plants be perfectly dry, when they are finally removed. Each plant is then placed in a sheet of dry paper, and along with it is deposited a slip of paper, on which are written the name of the plant, the place in which it was gathered, the time of gathering, the soil, and such other circumstances as may tend to elucidate the history of the species. Thus prepared, the plants are packed up in bundles, which gradually enlarge their dimensions, or increase in number, until the end of the season.

Having in this manner prepared a certain number of plants, the collector has now to arrange them. For this purpose he has to procure a quantity of good stout writing or printing paper of large size, folded in folio, which is to be stitched in colored covers, making fasciculi of five or six sheets each. A quantity of fine large post or other writing paper, in half sheets, folio size, cut round the edges, is also to be at hand. Let a number of narrow slips of different lengths be cut from a piece of the same paper, and let some

prepared isinglass or dissolved gum be in readiness, together with a camel-hair pencil. Take a dried plant, lay it upon a leaf of the fine cut paper, then fasten it down by means of a few of the slips, to which isinglass or gum has been applied, laid across the stem and some of the branches. Two or three slips are generally sufficient for a plant or specimen. In this manner all the dried plants destined to form part of the herbarium are treated. Write the name of each species on the top of the leaf, and transcribe the notice respecting the place in which it was gathered, &c. at the bottom. Then arrange the plant according to system, and lay one between every two pages of the fasciculi. The fasciculi are formed into bundles, by being laid alternately up and down upon each other, as they do not lie conveniently when the heads of the plants are all at the top of the bundle, because the stalks and roots are thicker than the flowers. These bundles, consisting each of ten fasciculi, may be covered by pieces of pasteboard tied by strings. The collection is kept on the shelves of a cabinet, or in a chest. To prevent the attacks of insects, it is necessary to keep beside it a piece of sponge soaked full of rectified oil of turpentine; and to ensure it against decay from damp, it ought to be kept in a dry and well-ventilated place.

The above is an orderly method of forming a herbarium; but many other expedients are resorted to. Most plants dry sufficiently well between the leaves of old books, and many collectors save themselves the trouble of forming a neat collection, by huddling up their specimens in the least expensive or laborious manner.

Another method of putting up dried plants is the following: The specimens are fastened to leaves of stout paper of uniform size; the species are then arranged in order, and all those of the same genus are placed within one or more sheets of paper, on the outside of which the generic name is written. The generic fasciculi are then collected into bundles, on which are written the names of the classes and orders. Some persons keep their specimens loose, within sheets of paper. This method is the most convenient for the minute examination of the plants, but has disadvantages which render it inexpedient in ordinary cases.

# GENERA OF PLANTS.

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## CLASS I.—MONANDRIA.

*Plants bearing flowers with one stamen.*

### ORDER I. MONOGYNIA. *One Pistil.*

**CANNA.** Calyx double; outer one short, three-cleft, permanent; inner one (or corol) six-parted, one of the divisions reflexed; anther simple, attached to the margin of the filament, which is petal-like and two-lobed; style thick, club-form; stigma obtuse; capsule muricate, three-celled; seeds numerous and globose.

**THALIA.** Calyx double; outer one small, three-leaved; inner one (or petal) five-parted; anther simple, ovate, inserted into a depressed filament; style short, bent from the anther; stigma perforated, ringent; capsule two-celled.

**SALICORNIA.** Calyx tumid, undivided; corolla none; stamens one or two; seed one, invested by the calyx.

**HIPPURIS.** Calyx obsolete; corolla none; stigma one, simple; seed one, inferior.

**ZOSTERA.** Spadix linear, many-flowered; calyx none; corolla none; stigmas two, linear; nut with one kernel.

### ORDER II. DIGYNIA. *Two Pistils.*

**CALLITRICHE.** Calyx none; petals two, inferior; seeds four, naked, compressed; some flowers pistilliferous and others stameniferous only.

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## CLASS II.—DIANDRIA.

*Plants bearing flowers with two stamens.*

### ORDER I. MONOGYNIA. *One Pistil.*

*Flowers inferior, of one petal, regular.*

**LIGUSTRUM.** Corolla four-cleft; berry two-celled; cells two-seeded.

**OLEA.** Calyx small, four-toothed; corol with a short tube, four-cleft, segments ovate; drupe one-seeded, often with an abortive rudiment.

*Flowers inferior, of one petal, irregular; seeds inclosed in a seed-vessel.*

**VERONICA.** Corolla wheel-shaped, deeply four-cleft, lower segment smaller; capsule two-celled.

CATALPA. Corol four or five-cleft, somewhat inflated, bell-form; calyx two-parted or two-leaved; stigma two-lipped; capsule cylindric, two-celled.

PINGUICULA. Corolla gaping, spurred; capsule one-celled; calyx five-cleft.

UTRICULARIA. Corolla masked, spurred; capsule one-celled; calyx of two leaves.

*Flowers inferior, of one petal, irregular; seeds naked.*

LYCOPUS. Corolla tubular, four-cleft; upper segment notched; stamens distant, simple; calyx tubular, five-cleft.

SALVIA. Corolla gaping; filaments transversely attached to a footstalk; calyx two-lipped.

*Flowers superior.*

CIRCEA. Corolla of two petals; calyx of two leaves; capsule two-celled; cells one-seeded.

•ORDER II. DIGYNIA. *Two Pistils.*

ANTHOXANTHUM. Calyx of two chaff-scales, containing one flower; corolla of two husks, awned.

### CLASS III.—TRIANDRIA.

*Plants bearing flowers with three stamens.*

ORDER I. MONOGYNIA. *One Pistil.*

*Flowers superior.*

IRIS. Calyx spathe two or three-valved; corol six-parted, divisions alternately reflexed; stigmas three, petal-like; style short; capsule three-celled.

*Flowers inferior, chaffy.*

SCIRPUS. Glume one-valved, one-flowered, chaffy, scales imbricated every way; styles filiform, caducous; corol none; seed single, naked, or surrounded with hairs or bristles.

RHYNOSPORA. Scales or glumes of the calyx fasciated into a spike, lower ones empty; corol none; styles permanent at the base; bristles surrounding the base of the seed.

ERIOPHORUM. Glume chaffy, one-valved, imbricated every way into a spike; corol none; seed beset round with very long, dense, woolly hairs.

ORDER II. DIGYNIA. *Two Pistils.*

MILIUM. Calyx two-valved, herbaceous, ventricose; corol two-valved, awnless, coriaceous, oblong, concave, shorter than the calyx; seed two-horned; nectary lateral; stigmas villose.

*Flowers in panicles.*

AGROSTIS. Calyx herbaceous, two-valved, one-flowered, valves acute, a little less than the corol; corol two-valved, membranaceous, often hairy at the base; stigmas longitudinally hispid or plumose; florets spreading; nectary lateral; seed coated.

**ARUNDO.** Calyx two-valved, unequal, membranaceous, surrounded with hair at the base; lower valve mucronate or slightly awned.

**ALOPECURUS.** Calyx two-valved, equal; glume generally connate at the base; corol one-valved, utricle-like, cleft on one side, awned below the middle.

**PHLEUM.** Calyx hard, two-valved, equal, sessile, linear, truncate, bicuspidate; corol enclosed in the calyx, two-valved, awnless, truncate.

**PHALARIS.** Calyx membranaceous, two-valved, valves keeled, nerved, equal in length, including the two-valved pilose corol. The corol is shorter than the calyx and coriaceous; rudiments opposite, sessile, resembling valves; nectary lateral.

**GLYCERIA.** Spikelets terete, elongated; calyx many-flowered, shorter than the florets; lower valve of the corol membranaceous and somewhat herbaceous; upper one somewhat conduplicate; nectary lateral, connate; stigma decomposed.

**BRIZA.** Spikelets heart-ovate, many-flowered; calyx chaffy, shorter than the two-ranked florets; corol ventricose; lower valve cordate, upper one orbicular, short.

**POA.** Spikelets oblong or linear, compressed, many-flowered; calyx shorter than the florets; corol herbaceous, awnless, often arachnoid at the base; lower valve scarious at the margin.

**FESTUCA.** Calyx two-valved, many-flowered; spikelets compressed-teretish, or diverging when mature, awnless, or furnished with a terminal awn; corol somewhat terete; upper valve acute, mucronate, or with a short bristle at the tip; seed growing to the corol.

**DACTYLIS.** Spikelets aggregated in unilateral heads, many-flowered; calyx shorter than the florets, with one large glume, keeled, pointed; corol with the lower valve keeled, emarginate, mucronate; upper valve sub-conduplicate.

**BROMUS.** Calyx shorter than florets, two-valved; spikelets terete, two-ranked, many-flowered; corol, outer valves bifid, awned below the tip; inner valve pectinate-ciliate, sub-conduplicate.

**AIRA.** Calyx longer than the florets, glossy, two-valved, two or three-flowered; corol two-valved; lower valve gnawed or toothed, awned on the back below the middle.

#### *Flowers in spikes.*

**LOLIUM.** Calyx one-leaved, permanent, many-flowered; florets in many-flowered, two-rowed, simple, sessile spikelets on a rachis; lower valve of the corol herbaceous-membranaceous, mucronate, or bristled at the tip.

**CYNODON.** Calyx two-valved, lanceolate, spreading; corol two-valved, longer than the calyx; the outer valve larger, and somewhat oval, and surrounding the inner one; rudiment minute, pedicelled; nectary truncate; spikes digitate and fascicled; flowers solitary.

**DIGITARIA.** Calyx one or two-valved, two-flowered; the outer valve very small or none; the innermost one of the length of the corol; corol two-valved, oblong-ovate, awnless; style very long; spikes digitate, unilateral, linear; spikelets on short bifid pedicels, in pairs; lower floret abortive, one-valved, herbaceous; upper floret perfect, with coriaceous valves.

**HORDEUM.** Spikelets three, at each joint of the rachis, one or two-flowered, all perfect, or the lateral ones abortive; glume lateral, subulate; perfect flower with a two-valved corol; lower valve ending in a bristle; seed coated.

#### ORDER III. TRIGYNIA. *Three Pistils.*

**POLYCARPON.** Calyx five-leaved; petals five, very short, emarginate, permanent; capsule ovate, one-celled, three-valved.

## CLASS IV.—TETRANDRIA.

*Plants bearing flowers with four stamens.*ORDER I. MONOGYNIA. *One Pistil.*

**DIPSACUS.** Common calyx involucre-like, many-leaved; proper calyx one-leaved, superior; receptacle chaffy; corol tubular, four-cleft; seed one, crowned with a wine-glass form egret; inflorescence an ovate head.

**GALIUM.** Calyx four-toothed; corol flat, four-cleft; fruit dry; seeds two, roundish.

**CORNUS.** Calyx four-toothed; drupe with a two-celled nut. Some species have a four-leaved involucre.

**ISNARDIA.** Calyx bell-form, four-parted or four-cleft, superior; capsule four-celled, four-cornered, many-seeded, surrounded by the calyx.

**PLANTAGO.** Calyx four-cleft; corol four-cleft, reflexed; capsule two-celled, opening transversely; stamens exsert, very long.

**SANGUISORBA.** Calyx two-leaved; corol four-cleft, wheel-form, adhering to the germ so as to appear as if superior; capsule four-sided.

**ALCHEMILLA.** Calyx eight-cleft; segments spreading, alternately smaller; style lateral from the base of the germ; fruit surrounded by the calyx.

**ICTODES.** General calyx a spathe; spadix simple, covered with flowers; perianth corol-like, deeply four-parted, permanent, becoming thick and spongy; style pyramid-form, four-sided; stigma simple, minute; berries globose, two-seeded, inclosed in the spongy spadix-receptacle.

ORDER II. DIGYNIA. *Two Pistils.*

**HAMAMELIS.** Involucre three-leaved; perianth four-leaved or four-cleft; petals four, very long, linear; nut two-celled, two-horned.

ORDER IV. TETRAGYNIA. *Four Pistils.*

**ILEX.** Calyx minute, four or five-toothed; corol four-parted, wheel-form; styis none; stigmas four; berry four-celled, cells one-seeded.

**POTAMOGETON.** Calyx (or green corol) four-leaved; petals none; style none; anthers sessile, alternating with the divisions; nuts four, one-seeded, sessile; seeds four.

**RUPPIA.** Calyx none; corol none; seeds four, pedicelled.

## CLASS V.—PENTANDRIA.

*Plants bearing flowers with five stamens.*ORDER I. MONOGYNIA. *One Pistil.**Flowers monopetalous, inferior. Seeds two or more, naked.*

**MYOSOTIS.** Calyx half five-cleft or five-cleft; corol salver-form, curved, five-cleft, vaulted, the lobes slightly emarginate; throat closed with five convex, converging scales; seeds smooth or echinate.

**LITHOSPERMUM.** Calyx five-parted, with acute keeled divisions; corol funnel-form, with an open throat, border five-lobed; stigma two-cleft; seeds ovate, pointed, stony, not perforated; stamens and pistils inclosed in the tube of the corol.

**CYNOGLOSSUM.** Calyx five-parted; corol short, funnel-form, vaulted; throat closed by five converging, convex processes; seeds depressed, affixed laterally to the style.

**LYCORSIS.** Calyx five-cleft; corol funnel-form; throat-closed with ovate converging scales; seeds perforated at the base.

**ECHIUM.** Calyx five-parted, segments subulate, erect; corol bell-form, obliquely and unequally five-lobed, tube short, throat naked; stigma cleft; seeds tubercled, not perforated at the base.

*Flowers monopetalous, inferior. Seeds in a capsule or dry drupe.*

**HOTTONIA.** Calyx five-parted; corol salver-form, five-lobed; stamens on the tube of the corol; stigma globular; capsule one-celled, globose, acuminate.

**LYSIMACHIA.** Calyx five-cleft; corol wheel-form, five-cleft; capsule one-celled, globular, five or ten-valved, mucronate; stigma obtuse.

**ANAGALLIS.** Calyx five-parted; corol wheel-form, deeply five-lobed; capsule opening transversely, globose, many-seeded; stamens hairy.

**MENYANTHES.** Calyx five-parted; corol hairy, funnel-form, five-lobed, equal and spreading; capsule ovate, one-celled, two-valved, with the seeds attached to the valves; stigma two-cleft, capitate.

**VERBASCUM.** Calyx five-parted; corol wheel-form, five-lobed, somewhat irregular; stamens declined, hairy; capsules two-celled, two-valved; valves inflexed when ripened, many-seeded.

**DATURA.** Calyx tubular, angled, caducous, with a permanent orbicular base corol funnel-form, plaited; capsule four-valved, two-celled, and each cell half divided generally thorny.

**HYOSCYAMUS.** Calyx tubular, five-cleft; corol funnel-form, five-lobed, obtuse, irregular; stamens inclined; capsule two-celled, covered with a lid.

**NICOTIANA.** Calyx urceolate, sub-tubular, five-cleft; corol funnel-form, five-cleft, limb plaited; stigma notched, capitate; stamens inclined; capsules two-celled, two to four-valved.

**CONVOLVULUS.** Calyx five-parted, with or without two bracts; corol funnel-form, plaited; stigma two-cleft or double; cells of the capsule two or three; each one or two-seeded.

**AZALEA.** Calyx five-parted; corol tubular, half five-cleft, somewhat oblique; stamens on the receptacle, declined; stigma declined, obtuse, usually ending with five short papillæ; capsule five-celled, five-valved, opening at the top.

*Flowers monopetalous, inferior. Seeds in a drupe or berry.*

**SOLANUM.** Calyx five to ten-parted, permanent; corol bell or wheel-form, five-lobed, plaited; anthers thickened, partly united, with two pores at the top; berry containing many seeds, two to six-celled.

*Flowers monopetalous, superior. Seeds in a capsule.*

**CAMPANULA.** Calyx mostly five-cleft; corol bell-form, closed at the bottom by valves bearing the flattened stamens; stigma three to five-cleft; capsules three to five-celled, opening by lateral pores.

**LOBELIA.** Calyx five-cleft; corol irregular, often irregularly slitted; anthers cohering, and somewhat curved; stigma two-lobed; capsule two or three-celled.

**SAMOLUS.** Calyx five-cleft, half superior, permanent; corol salver-form, five-lobed,

with five intermediate scales fencing up the stamens between them; capsule one-celled, five-toothed, many-seeded.

*Flowers polypetalous, inferior. Seeds in a drupe, berry, or berried capsule.*

**CEANOTHUS.** Petals scale-like, vaulted; claws long, standing in the five-cleft, cup-form calyx; stigmas three; berry or capsule dry, three-grained, three-celled, three-seeded, three-parted, opening on the inner side.

*Flowers polypetalous, inferior. Seeds in a capsule.*

**IMPATIENS.** Calyx two-leaved, deciduous; corol irregular, spurred; anthers cohering at the top; capsule five-valved, bursting elastically when ripe.

**VIOLA.** Calyx five-leaved or deeply five-cleft; corol irregular, with a horn behind; (sometimes the horn is wanting or a mere prominence) anthers attached by a membranous tip, or slightly cohering; capsule one-celled, three-valved.

*Flowers polypetalous, superior.*

**RIBES.** Calyx bell-form, five-cleft, (sometimes flat); corol and stamens inserted on the calyx; style two-cleft; berry many-seeded.

## ORDER II. DIGYNIA. Two Pistils.

*Flowers monopetalous, inferior. Fruit in a follicle or capsule.*

**APOCYNUM.** Corolla campanulate; filaments five, alternate with the stamens; style none; stigma broad; follicles long, linear.

**ASCLEPIAS.** Corona five-leaved, with a process on the inside; pollen masses fixed by a fine end; stigma depressed, blunt.

*Flowers monopetalous, inferior. Fruit a capsule.*

**GENTIANA.** Calyx four or five-cleft; corol with a tubular base, bell-form, without pores, four or five-cleft; stigmas two, sub-sessile; capsule one-celled, oblong; columellas two, longitudinal; stamens but four, when the divisions of corol are four.

*Flowers pentapetalous, inferior.*

**CHENOPodium.** Calyx five-parted, obtusely five-angled, inferior; style deeply two-cleft; seed one, lens-like, horizontal, invested by the calyx.

**ULMUS.** Calyx bell-form, withering; border four or five-cleft; seed one, enclosed in a flat membranaceous samara.

*Flowers pentapetalous, superior. Seeds two.*

**SANICULA.** Seeds hispid, with hooked prickles; calyx five-parted, permanent; umbel sub-simple, capitate; involucre few-flowered.

**DAUCUS.** Seeds striate on their joining sides; outer sides convex, having hispid ribs; involucre pinnatifid; flowers sub-radiated, abortive in the disk.

**Sium.** Fruit ovate or orbicular, ribbed, furrowed; calyx small, acute, unequal, or obsolete; petals inversely heart-shaped or obovate, equal; styles cylindrical, shorter than the petals; floral receptacle none; flowers uniform, united.

**CICUTA.** Flowers nearly orbicular, heart-shaped at the base, with six double ribs; calyx broad, acute, rather unequal; petals ovate or slightly heart-shaped, nearly equal; style scarcely tumid at the base; floral receptacle depressed, withering; flowers uniform, nearly regular, united.



**CONIUM.** Fruit ovate, with ten acute ribs, wavy in an unripe state; calyx obsolete; petals inversely heart-shaped, slightly unequal; styles a little tumid at the base; floral receptacle dilated, depressed, wavy, permanent; flowers slightly irregular, united.

**ANGELICA.** Seeds elliptic-oblong, convex, with three dorsal wings, and a narrow, flat, even border; calyx none; petals lanceolate, flattish, undivided, contracted at each end, equal; floral receptacle thin, wavy, narrow, permanent; flowers all perfect.

**LIGUSTICUM.** Seeds oblong-convex, with three dorsal and two marginal equal wings; calyx small, pointed, erect, broad at the base; petals elliptical, flattish, undivided, contracted at each end, equal; floral receptacle none; flowers all perfect, regular.

**PASTINACA.** Seeds elliptic-obovate, with a slight notch at the summit, very nearly flat, with three dorsal ribs and two marginal ones; border narrow, flat, thin, even, smooth, and entire; calyx very minute, obsolete; petals broadly lanceolate, involute, equal; floral receptacle broad, orbicular, wavy, rather thin, concealing the calyx; flowers regular, uniform, perfect.

**HERACLEUM.** Seeds inversely heart-shaped, with a notch at the summit, very nearly flat, with three slender dorsal ribs, two distant marginal ones, and four intermediate, colored, depressed, abrupt lines from the top; border narrow, slightly tumid, smooth, even, and entire; calyx of five small, acute, evanescent teeth; petals inversely heart-shaped, radiant; floral receptacle wavy, crenate, obtuse; flowers separated.

#### ORDER III. TRIGYNIA. *Three Pistils.*

##### *Flowers superior.*

**VIBURNUM.** Corolla five-cleft; berry with one seed.

**SAMBUCUS.** Corolla five-cleft; berry with three seeds.

##### *Flowers inferior.*

**RHUS.** Calyx five-parted; petals five; berry one-seeded.

**STAPHYLEA.** Petals five; capsules two or three, inflated.

#### ORDER IV. TETRAGYNIA. *Four Pistils.*

**PARNASSIA.** Nectaries fringed with bristles bearing globes; capsule four-valved.

#### ORDER V. PENTAGYNIA. *Five Pistils.*

##### *Flowers superior.*

**ANALIA.** Involucre very small; umbels globose; calyx very small, five-toothed; petals five, ovate, oblong, spreading or reflexed; stigmas nearly round, five to ten; berry roundish, crowned, five-seeded; seeds hard, oblong.

##### *Flowers inferior.*

**LINUM.** Petals five; capsule of ten cells.

**DROSERIA.** Petals five; capsule of three valves, with many seeds.

**STATICE.** Calyx two-leaved, entire, plaited, scarious; petals five; seeds one, superior; flowers scattered in a panicle or spiked scape.

#### ORDER VI. POLYGYNIA. *Many Pistils.*

**MYOSOTIS.** Petals five, with tubular, honey-bearing claws; seeds naked; calyx spurred at the base.

## CLASS VI.—HEXANDRIA.

*Plants bearing flowers with six stamens.*ORDER I. MONOGYNIA. *One Pistil.**Monocotyledons. Perianth superior, colored.*

NARCISSUS. Sepals six, equal; cup funnel-shaped, of a single leaf; stamens inserted within the cup.

AGAVE. Flower erect, tubular, or funnel-shaped; filaments longer than the flower, erect; capsule triangular, many-seeded.

PONTEDERIA. Flower monosepalous, six-cleft, two-lipped; stamens inserted into the tube of the flower at the top; capsule three-celled.

*Monocotyledons. Perianth inferior.*

ACORUS. Spadix cylindrical, covered with florets; sepals six, naked; style none; capsule three-celled.

JUNCUS. Sepals six, persistent; stigmas three; capsule one-celled, three-valved; seeds very numerous.

LUZULA. Sepals six; stigmas three; capsule one-celled, three-valved, three seeded; seeds fixed to a central receptacle.

LILIUM. Sepals six, campanulate, with a longitudinal honey-line, and generally reflexed; valves of the capsule connected by a mesh of hairs.

CONVALLARIA. Flower six-cleft, campanulate; berry spotted, three-celled.

ALLIUM. Flower six-parted, spreading; spathe many-flowered; umbel clustered.

ASPARAGUS. Flower six-parted, erect; the three lower sepals reflexed at the end; berry three-celled, many-seeded.

*Dicotyledons.*

BERBERIS. Calyx five-leaved; petals six, with glands upon their claws; style none; stigma umbilicate; berry one-celled, two or three-seeded.

ORDER III. TRIGYNIA. *Three Pistils.*

RUMEX. Calyx three-leaved; petals three, conniving; seed one, three-cornered.

ORDER IV. POLYGYNIA. *Many Pistils.*

ALISMA. Flower six-parted, the three outer sepals falling off late like a calyx, the three inner petaloid; stamens six; ovaries indefinite in number, one-seeded; capsules distinct, not opening.

## CLASS VII.—HEPTANDRIA.

*Plants bearing flowers with seven stamens.*ORDER I. MONOGYNIA. *One Pistil.*

TRIENTALIS. Calyx seven-leaved; corolla seven-parted, equal, flat; berry without juice.

## CLASS VIII.—OCTANDRIA.

*Plants bearing flowers with eight stamens.*ORDER I. MONOGYNIA. *One Pistil.**Ovary superior.*

**MERZERIA.** Calyx one-leaved; corolla monopetalous, ovate; filaments inserted in the receptacle; capsule four-celled, with the septa from the inflexed edges of the valves; seeds numerous.

*Ovary inferior.*

**GENOTHERA.** Calyx tubular, four-cleft, with deciduous, deflexed segments; petals four, inserted in the calyx; stigma four-cleft; capsule four-celled, four-valved, inferior; seeds naked, affixed to a four-cornered central receptacle.

**EPILOBIUM.** Calyx four-cleft, tubular; petals four; capsule oblong, inferior; seeds comose.

**XYCOCCLUS.** Calyx four-cleft; corolla four-parted, with linear, revolute segments; filaments conniving; anthers tubular, two-parted; berry many-seeded.

**VACCINIUM.** Corolla urceolate or campanulate, four or five-cleft, with reflexed segments; filaments inserted on the ovary; berry four or five-celled, many-seeded.

**DAPHNE.** Corolla four-cleft, like a calyx, withering, including the stamens; drupe one-seeded.

**DIECA.** Corolla tubular, with an obsolete limb; stamens longer than the tube; berry one-seeded.

ORDER III. TRIGYNIA. *Three Pistils.*

**POLYGONUM.** Calyx none; corolla five-parted, like a calyx; seed one, angular, covered; (stamens and styles uncertain in number.)

## CLASS IX.—ENNEANDRIA.

*Plants bearing flowers with nine stamens.*ORDER I. MONOGYNIA. *One Pistil.*

**LAURUS.** Calyx four or six-parted; nectary three glands, with two bristles surrounding the ovary; anthers opening transversely; valves hinged to the upper side.

## CLASS X.—DECANDRIA.

*Plants bearing flowers with ten stamens.*ORDER I. MONOGYNIA. *One Pistil.**Ovary superior. Stamens separate. Flowers complete.*

**MONOTROPA.** Calyx like a corolla, gibbous at the base; capsule five-celled, many-seeded.

**DIONÆA.** Calyx five-leaved; petals five; capsule one-celled, gibbous, many-seeded.

**KALMIA.** Calyx five-parted; corolla hypocrateriform, with a limb having five horns beneath; capsule five-celled.

**RHODODENDRON.** Calyx five-parted; corolla somewhat funnel-shaped; stamens declinate; capsule five-celled.

**EPIGÆA.** Outer calyx three-leaved, inner five-parted; corolla salver-shaped; capsule five-celled.

**ANDROMEDA.** Calyx five-parted; corolla ovate, with a five-cleft orifice; capsule five-celled, valves contrary to the dissepiment.

**GAULTHERIA.** Outer calyx two-leaved, inner five-cleft, ovate; nectary with ten points; capsule five-celled, clothed with an inner berried calyx.

**ARBUTUS.** Calyx five-parted; corolla ovate, with a five-cleft orifice, pellucid at the base; berry five-celled.

**PIRELA.** Calyx five-parted; petals five; capsule five-celled, opening at the angles.

#### ORDER II. DIGYNIA. *Two Pistils.*

**SCLERANTHUS.** Calyx one-leaved; corolla none; seeds two, included in the calyx.

**SAXIFRAGA.** Calyx five-parted; petals five; capsule two-beaked, one-celled, many-seeded.

**SAPONARIA.** Calyx one-leaved, naked; petals five, clawed; capsule one-celled, oblong.

**DIANTHUS.** Calyx cylindrical, one-leaved, with scales at the base; petals five, clawed; capsule cylindrical, one-celled.

#### ORDER III. TRIGYNIA. *Three Pistils.*

**SILENE.** Calyx one-leaved, ventricose; petals five, clawed; capsule half three-celled, opening at the end, many-seeded.

**STELLARIA.** Calyx five-leaved, spreading; petals five, two-parted; capsule one-celled, many-seeded.

**ARENARIA.** Calyx five-leaved, spreading; petals five, entire; capsule one-celled, many-seeded.

#### ORDER IV. PENTAGYNIA. *Five Pistils.*

**OXALIS.** Sepals five, distinct or united at the base; petals five; stamens united at the base, the five outer shortest; styles five, pencil-shaped, or capitate at the end; capsule oblong or cylindrical.

**CERASTIUM.** Sepals five; petals bifid; capsule one-celled, opening at the end.

**SPERGULA.** Sepals five; petals five, entire; capsule ovate, one-celled, five-valved.

### CLASS XI.—DODECANDRIA.

*Plants bearing flowers with twelve stamens.*

#### ORDER I. MONOGYNIA. *One Pistil.*

**ASARUM.** Calyx three or four-cleft, superior; corolla none; capsule coriaceous, crowned.

PORTULACA. Petals five; calyx bifid; capsule one-celled, cut across.

LYTHRUM. Calyx twelve-toothed, tubular, unequal at the base; petals six, inserted in the calyx; capsule two-celled, many-seeded.

ORDER II. DIGYNIA. *Two Pistils.*

AGRIMONIA. Calyx five-toothed, surrounded by another; petals five; grains two, in the bottom of the calyx.

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CLASS XII.—ICOSANDRIA.

*Plants bearing flowers with many stamens inserted into the calyx.*

ORDER I. MONOGYNIA. *One Pistil.*

*Ovary inferior.*

CACTUS. Calyx imbricated; petals numerous, in many rows, the inner largest; stigma many-cleft; berry many-seeded.

*Ovary superior.*

AMYGDALUS. Calyx five-cleft; petals five; drupe with a nut perforated on its surface.

PRUNUS. Calyx five-cleft; petals five; drupe with a hard, smooth nut.

ORDER II. DIPENTAGYNIA. *Two to five Pistils.*

*Ovary inferior.*

MESPILUS. Calyx five-parted, with leafy divisions; disk large, honey-bearing; styles smooth; apple turbinate, open, five-celled, with a bony putamen.

CRATÆGUS. Calyx five-toothed; petals spreading, orbicular; ovary two to five-celled; styles smooth; apple fleshy, oblong, closed by the teeth of the calyx, or by the thickened disk; putamen bony.

PYRUS. Calyx five-toothed; petals roundish; apple closed, five-celled, with a cartilaginous putamen; cells two-seeded; testa cartilaginous.

*Ovary superior.*

SPIRÆA. Calyx spreading, five-cleft; petals five; capsule one-celled, two-valved, opening inwards, one to three-seeded.

ORDER III. POLYGYNIA. *Many Pistils.*

ROSA. Calyx urceolate, five-cleft, fleshy, contracted at the orifice; petals five; grains bony, hairy, included in the fleshy tube of the calyx.

RUBUS. Calyx five-cleft; petals five; berry composed of many cohering fleshy grains; receptacle nearly dry.

GEUM. Calyx ten-cleft; sepals unequal; petals five; grains generally with a jointed awn.

FRAGARIA. Calyx ten-cleft; petals five; grains inserted upon a fleshy deciduous receptacle.

POTENTILLA. Calyx ten-cleft; petals five; grains rugose, roundish, naked, fixed to a small dry receptacle.

## CLASS XIII.—POLYANDRIA.

*Plants bearing flowers with many stamens inserted under the ovary.*ORDER I. MONOGYNIA. *One Pistil.*

ACTÆA. Calyx four-leaved, deciduous; petals four; berry one-celled; seeds half orbicular.

SANGUINARIA. Calyx two-leaved; petals eight; pod ovate, one-celled.

PODOPHYLLUM. Calyx three-leaved; petals nine; berry one-celled, crowned with the stigma.

CHELIDONIUM. Calyx two-leaved; petals four; pod one-celled, linear; dissepiment none; seeds several, crested.

PAPAVER. Calyx two-leaved; petals four; capsule one-celled, opening by pores under the persistent stigma.

SARRACENIA. Calyx double, three to five-leaved; petals five; capsule five-celled; style with a clypeate stigma.

NYMPHÆA. Sepals at the base of the discus; petals and stamens connected with the whole of the discus, which covers the carpella.

TILIA. Calyx five-parted; petals five; capsule coriaceous, globose, five-celled, four-valved, opening at the base, one-seeded.

ORDER II. DI-TRIGYNIA. *Two or three Pistils.*

PÆONIA. Calyx five-leaved; petals five; style none; capsule many-seeded, like a pod.

ACONITUM. Calyx none; petals five, the upper vaulted; nectaries two, hooded, stalked, recurved; siliques three to five.

ORDER III. PENTAGYNIA. *Five Pistils.*

AQUILEGIA. Calyx none; petals five; nectaries five, horned between the petals; capsules five, distinct.

ORDER IV. POLYGYNIA. *Many Pistils.*

LIRIODENDRON. Calyx three-leaved; petals six; samaras imbricated in a cone; capsule one or two-seeded, not opening, attenuated.

MAGNOLIA. Calyx five-leaved; petals six to nine; capsule two-valved, one-seeded, imbricated in a cone; seeds pendulous.

ANONA. Sepals three, united at the base, concave, cordate, acute; petals six, thick, the interior thicker or none; anthers sub-sessile, with a dilated angular end; berry pulpy, many-celled towards the outside.

HEPATICA. Involucre three-leaved, one-flowered, resembling a calyx, entire; sepals petaloid, six to nine, arranged in two or three rows; ovaries many; grains without an awn.

ANEMONE. Involucre three-leaved, distant from the flower, cut; sepals five to fifteen, petaloid; petals none.

COPTIS. Sepals five or six, colored, petaloid, deciduous; petals small, cucullate; stamens twenty to twenty-five; capsules six to ten, on long stalks, membranous, four to six-seeded.

**CALTHA.** Sepals five, colored, round; petals none; stamens many; capsule spreading, one-celled, many-seeded.

**HYDROPELTIS.** Sepals three or four; petals three or four; ovaries six to eighteen; seeds in a pendulous, ovate, globose capsule.

**RANUNCULUS.** Sepals five, not deciduous; petals five, rarely ten, with a honey-scale at the base; grains pointed.

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### CLASS XIV.—DIDYNAMIA.

*Plants bearing flowers with four stamens, of which two are shorter than the others.*

#### ORDER I. GYMnosPERMIA. *Seeds naked.*

**TEUCRIUM.** Upper lip of corolla none, two-parted beyond the base; stamens exerted.

**NEPETA.** Calyx dry, striated; corolla with a longish tube, the middle segments of the lower lip crenate; orifice reflexed at the edge; stamens approximating.

**MENTHA.** Corolla nearly equal, four-fid, with the broadest segment emarginate; stamens erect, distant.

**GLECHOMA.** Calyx five-fid; each pair of anthers forming by their union the figure of a cross.

**LAMIUM.** Upper lip of corolla entire, vaulted, lower two-lobed, the orifice toothed at the edge on both sides.

**GALBOPSIS.** Upper lip of corolla somewhat crenate, vaulted, lower two-toothed above.

**BALLOTA.** Calyx hypocrateriform, five-toothed, ten-lined; upper lip of corolla crenate, concave; grains ovate, three-cornered.

**LEONURUS.** Calyx five-angled, five-toothed; upper lip of corolla villous, flat, entire, lower three-parted, with the middle segment undivided; anthers covered, with shining spots.

**PTCANTHEMUM.** Involucre of many bractees beneath the little heads; calyx tubular, striated; upper lip of corolla nearly entire, lower trifid; stamens nearly equal.

**ORIGANUM.** Cone four-cornered, spiked, collecting the calyces; upper lip of the corolla erect, flat, lower three-parted, with nearly equal segments.

**TRICHOSTEMA.** Upper lip of corolla falcate; stamens very long.

**SCUTELLARIA.** Calyx entire, after flowering closed with a lid; tube of the corolla elongated.

**PRUNELLA.** Upper lip of the calyx dilated; filaments forked, upon one point bearing their anthers; stigma bifid.

#### ORDER II. ANGiosPERMIA. *Seeds in a Capsule.*

*Ovary inferior, or nearly inferior.*

**LINNEA.** Calyx double, of the fruit two-leaved, of the flower five-parted; corolla campanulate; berry dry, three-celled.

*Ovary superior, monopetalous.*

**BIGNONIA.** Calyx five-fid, cup-shaped; corolla campanulate, five-fid, ventricose beneath; pod two-celled; seeds with membranous wings.

**VERBENA.** Calyx five-fid; corolla funnel-shaped, with an incurved tube, and an unequal five-fid limb; stamens four, fertile; fruit bladdery, covered, withering; seeds four.

**RHINANTHUS.** Calyx four-fid, ventricose; corolla ringent, with the upper lip generally compressed; capsule two-celled, blunt, compressed.

**LINARIA.** Calyx five-parted, with the two lower segments remote; corolla spurred, ringent, the orifice closed by the prominent palate; capsule ovate, two-valved, opening at the end into three to five segments.

**GERARDIA.** Calyx five-fid; corolla two-lipped, the lower lip three-parted, with emarginate lobes, the middle two-parted; capsule three-celled, splitting.

**PEDICULARIS.** Calyx five-fid; corolla ringent; capsule two-celled, mucronate, oblique; seeds truncated; leaves multifid.

**MIMULUS.** Calyx prismatical, five-toothed; corolla ringent, with the upper lip folded back at the sides; stigma thick; capsule two-celled, many-seeded.

**DIGITALIS.** Calyx five-parted; corolla campanulate, ventricose, five-fid; capsule ovate, two-celled.

**SCROPHULARIA.** Calyx five-fid; corolla sub-globose, resupinate; capsule two-celled.

### CLASS XV.—TETRADYNAMIA.

*Plants bearing flowers with six stamens, of which four are longer than the other two.*

*Cotyledons flat, accumbent. Radicle lateral. Seeds compressed.*

**ARABIS.** Silique linear, with flat valves, one-nerved in the middle; seeds in one row in each cell.

**CARDAMINE.** Silique linear, with flat nerveless valves, often opening with elasticity; funicles of the hilum slender.

*Cotyledons flat, incumbent. Radicle dorsal. Seeds ovate, not margined.*

**LEPIDIUM.** Silicle ovate or sub-cordate, with carinate or rarely ventricose valves, opening with one-seeded cells.

*Cotyledons incumbent, folded together, or plaited lengthwise through their middle, and enveloping the radicle. Style generally enlarged, with a cell and seed at its base. Seeds generally globose, never margined.*

**BRASSICA.** Silique roundish; style small, short, obtuse; seeds in one row; calyx closed.

**SINAPIS.** Silique roundish, with nerved valves; style small, short, acute; seeds in one row; calyx spreading.

**RAPHANUS.** Silique transversely many-celled or dividing into several joints.

### CLASS XVI.—MONADELPHIA.

*Plants bearing flowers with the filaments united together throughout the whole or a part of their length.*

#### ORDER V. DECANDRIA. Ten Stamens.

**GERANIUM.** Calyx five-leaved; petals five, regular; glands five, honey-bearing, united to the base of the longer filaments; cocci five, one-seeded, awned, at the base of a beaked receptacle.



ORDER VII. POLYANDRIA. *Many Stamens.*

MALVA. Calyx double, outer three-leaved; capsules many, one-seeded.

ALTHEA. Calyx double, outer six to nine-fid; capsules many, one-seeded.

HIBISCUS. Calyx double, outer many-leaved; stigmas five; capsule five-celled, many-seeded.

GORDONIA. Calyx simple; style five-cornered, with a five-fid stigma; capsule five-celled; seeds twin, with a leafy wing.

CAMELLIA. Calyx imbricated, many-leaved, the inner leaflets largest.

## CLASS XVII.—DIADELPHIA.

*Stamens united in two separate parcels.*

ORDER III. OCTANDRIA. *Eight Stamens.*

POLYGALA. Calyx of five leaves, two of them wing-shaped and colored; capsule compressed, obcordate.

ORDER IV. DECANDRIA. *Ten Stamens.*

GENISTA. Calyx two-lipped, upper one with two, lower one with three teeth; vexillum bent backwards from the rest of the flower.

LUPINUS. Calyx two-lipped; anthers, five oblong, five round; legume coriaceous, terulose, compressed.

PHASEOLUS. Carina with the stamens and style twisted spirally.

LATHYRUS. Style plane, downy above, broader upwards; calyx with its two upper segments shortest.

VICIA. Style bearded beneath the stigma.

ROBINIA. Calyx four-fid, upper segment two-parted; legume gibbous, long; leaves unequally pinnate.

INDIGOFERA. Calyx spreading; carina with a spreading subulate spur on each side.

TRIFOLIUM. Legume in general shorter than the calyx, one or many-seeded, indehiscent, deciduous; flowers more or less capitate.

## CLASS XVIII.—POLYADELPHIA.

*Stamens united into several parcels.*

ORDER II. POLYANDRIA. *Stamens indefinite in number.*

CITRUS. Calyx five-fid; petals five, oblong; anthers twenty, the filaments variously divided; berry nine-celled.

HYPERICUM. Calyx five-parted; petals five; filaments many, in three or five parcels; capsule superior.

## CLASS XIX.—SYNGENESIA.

*Stamens five; anthers united by their edges.*

## ORDER I. ÆQUALIS.

*Flowers of the disk and ray all hermaphrodite.*

**SONCHUS.** Involucre imbricated, swelling at the base; receptacle naked; pappus simple, sessile.

**LACTUCA.** Involucre imbricated, cylindrical, its scales with a membranous margin; receptacle naked; pappus simple, stipitate.

**LEONTODON.** Involucre with scales that are frequently lax and flaccid; receptacle naked; pappus simple, stipitate.

**APARGIA.** Involucre imbricated with scales at the base; receptacle naked, dotted; pappus feathery, sessile, unequal.

**CICHORIUM.** Involucre surrounded with scales or smaller leaflets; receptacle naked or slightly hairy; pappus sessile, scaly, shorter than the pericarp.

**ARCTIUM.** Involucre globose, each of its scales with an incurved hook at the extremity; receptacle chaffy; pappus simple.

**CNICUS.** Involucre swelling, imbricated with spinous scales; receptacle hairy; pappus deciduous, feathery.

**ONOPORDUM.** Involucre swelling, its scales spreading and spinous; receptacle cellular; pappus deciduous, rough.

**VERNONIA.** Receptacle naked; involucre ovate, imbricated; pappus double, outer paleaceous, inner capillary.

**EUPATORIUM.** Involucre imbricated, oblong; florets few; receptacle naked; pappus rough.

**BIDENS.** Involucre of many leaves, with many foliaceous bractees at the base; receptacle plane, chaffy; corolla sometimes radiant; pericarps crowned with from two to five persistent awns, which are rough, with minute deflexed bristles.

## ORDER II. SUPERFLUA.

*Florets of the disk hermaphrodite—of the ray female.*

**TANACETUM.** Involucre hemispherical, imbricated; receptacle naked; florets of the ray trifid, obsolete, sometimes wanting; pericarps crowned with a membranous margin or pappus.

**ARTEMISIA.** Involucre ovate or rounded, imbricated; receptacle naked or downy; florets of the ray subulate; pericarps crowned with a membranous pappus.

**GNAPHALIUM.** Receptacle naked; pappus hairy or feathery; involucre imbricated, marginal scales round, scarious, colored.

**SENECIO.** Involucre subcylindrical, equal, scaly below, the scales withered at the tip; receptacle naked; pappus simple.

**ASTER.** Involucre imbricated, its lowermost scales spreading; receptacle naked; florets of the ray more than ten; pappus simple.

**SOLIDAGO.** Involucre imbricated, its scales connivent; receptacle naked; florets of the ray (of the same color as those of the disk) about five; pappus rough.

**INULA.** Involucre imbricated; receptacle naked; florets of the ray very numerous, linear; anthers with two bristles at the base; pappus simply composed of hairs.

**CHERYANTHEMUM.** Involucre hemispherical, imbricated with scales whose borders are membranous; receptacle naked; pappus none.

**ANTHEMIS.** Involucre hemispherical, its scales nearly equal, their margins scarious; receptacle convex, chaffy; pericarps crowned with a membranous border or pappus.

**ACHILLEA.** Involucre ovate, imbricated, unequal; receptacle plane, chaffy; florets of the ray five to ten, roundish, obcordate; pericarps naked.

ORDER III. FRUSTRANEA.

*Florets of the disk fertile—of the ray sterile.*

**HELIANTHUS.** Receptacle paleaceous, flat; pappus two-leaved; involucre imbricated, subsquarrose.

**CENTAUREA.** Involucre scaly; receptacle bristly; corollas of the ray infundibuliform, irregular, longer than those of the disk; pappus simple.

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CLASS XX.—GYNANDRIA.

*Stamens seated on the style or germen.*

ORDER I. MONANDRIA. *One Stamen.*

*Anther terminal, erect; pollen granular, cohering by an elastic thread.*

**ORCHIS.** Corolla ringent; lip spurred on the under side at the base; glands of the stalks of the pollen-mass contained in one common little pouch.

*Anther parallel with the stigma. Pollen powdery.*

**NEOTIA.** Flowers connivent; lip sessile, two-lobed, with no calli; anther terminal, sessile; stigma two-lipped, pervious, the front lip thickened.

ORDER II. DIANDRIA. *Two Stamens.*

**CYPRIPEDIUM.** Lip ventricose, inflated; column terminated by a petaloid lobe dividing the anthers; two anterior sepals usually united.

ORDER III. HEXANDRIA. *Six Stamens.*

**ARISTOLOCHIA.** Calyx none; corolla monopetalous, ligulate, ventricose at base; capsule six-celled, many-seeded, inferior.

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CLASS XXI.—MONCECIA.

*Male and female organs in distinct flowers, but upon the same plant.*

ORDER II. DIANDRIA. *Two Stamens.*

**LEMNA.** Male: calyx one-leaved; corolla none. Female: calyx one-leaved; corolla none; style one; capsule one-celled, two-seeded.

ORDER III. TRIANDRIA. *Three Stamens.*

**TYPHA.** Flowers collected into cylindrical dense-spikes or catkins. Barren flower: perianthium none; stamens three together, upon a chaffy or hairy receptacle,

united below into one filament. Fertile flower: perianthium none; pericarp pedicellate, surrounded at the base with hairs resembling a pappus.

**SPARGANIUM.** Flowers in spherical dense heads. Barren flower: perianth single, of three leaves. Fertile flower: single, of three leaves; drupe dry, with one seed.

**CAREX.** Flowers collected into an imbricated catkin. Barren flower: calyx of one scale, glumaceous; corolla none. Fertile flower: calyx of one leaf, glumaceous; corolla of one leaf, urceolate, ventricose; stigmas two or three; nut triquetrous, included within the persistent corolla.

**ZEAL.** Male in distinct spikes; calyx a two-flowered blunt glume; corolla a blunt glume. Female: calyx a two-valved glume; corolla a two-valved glume; style one, filiform, pendulous; seeds solitary, immersed in an oblong receptacle.

#### ORDER IV. TETRANDRIA. *Four Stamens.*

**ALNUS.** Flowers collected into imbricated catkins. Barren flower: scale of the catkin three-lobed, with three flowers; perianthium single, four-partite. Fertile flowers: scale of the catkin subtrifid, with two flowers; perianthium none; styles two; fruit compressed.

**BETULA.** Barren flower in a cylindrical catkin, its scales three-flowered; perianthium none; stamens ten or twelve. Fertile flower: scale of the catkin imperfectly three-lobed, three-flowered; perianthium none; styles two; germens compressed, two-celled, one abortive; nuts compressed, with a membranaceous margin, one-seeded.

**MORUS.** Male: calyx four-parted; corolla none. Female: calyx four-leaved; corolla none; styles two; calyx berried; seed one.

#### ORDER V. PENTANDRIA. *Five Stamens.*

**AMARANTHUS.** Male: calyx three or five-leaved; corolla none; stamens three or five. Female: calyx of the male; corolla none; styles three; capsule one-celled, cut round about.

#### ORDER VII. POLYANDRIA. *Stamens more than six.*

**MYRIOPHYLLUM.** Barren flower: calyx of four leaves; petals four; stamens eight. Fertile flower: calyx of four leaves; petals four; stigmas four, sessile; nuts four, subglobose, one-seeded.

**SAGITTARIA.** Male: calyx three-leaved; petals three; stamens about twenty-four. Female: calyx three-leaved; petals three; ovaries many; seeds many, naked.

**CASTANEA.** Barren flower in a very long cylindrical catkin; perianthium single, of one leaf, six-cleft; stamens five to twenty. Fertile flowers three, within a four-lobed, thickly muricated involucre; perianthium single, urceolate, five or six-lobed, having the rudiments of twelve stamens; germen incorporated with the perianthium, six-celled, with the cells two-seeded, five of them mostly abortive; styles six; nut one or two-seeded, invested with the enlarged involucre.

**OSTREA.** Male, an imbricated catkin; calyx a scale; corolla none; filaments branched. Female, a naked catkin; calyx none; corolla none; capsule inflated, imbricated, one-seeded at base.

**CARPINUS.** Barren flower in a cylindrical catkin, its scales roundish, ciliated at the base; stamens from eight to twenty. Fertile flower in a lax catkin, its scales large, foliaceous, three-lobed, one-flowered; involucre none; perianthium of one leaf, urce-

olate, six-dentate, incorporated with the two-celled germen, of which one cell is abortive; styles two; nut ovate, striated, one-seeded.

**FAGUS.** Barren flower in a globose catkin; perianthium single, of one leaf, campanulate, six-cleft; stamens from five to twelve. Fertile flowers two, within a four-lobed prickly involucre; perianthium single, urceolate, with four or five minute lobes; germen incorporated with the perianthium, three-celled, two of them becoming abortive; styles three; nuts one-seeded, invested with the enlarged involucre.

**CORYLUS.** Barren flower in a cylindrical catkin, its scales three-cleft; perianthium none; stamens eight; anthers one-celled. Fertile flower: perianthium obsolete; germen several, surrounded by a scaly involucre; stigmas two; nut one-seeded, surrounded at the base with the enlarged, united, coriaceous scales of the involucre.

**JUGLANS.** Male, an imbricated catkin; calyx a scale; corolla six-parted; filaments from four to eighteen. Female: calyx four-fid, superior; corolla four-fid; styles two; drupe coriaceous, with a furrowed nut.

**QUERCUS.** Barren flower in a lax catkin; perianthium single, somewhat five-cleft; stamens from five to ten. Fertile flower: involucre cup-shaped, scaly; perianthium single, incorporated with the germen, six-lobed; germen three-celled, two of them abortive; style one; stigmas three; nut (acorn) one-celled, one-seeded, surrounded at the base by the enlarged cup-shaped involucre.

**LIQUIDAMBAR.** Male, a conical catkin, surrounded by a four-leaved involucre; calyx none; corolla none; filaments numerous. Female, a globose catkin, surrounded by a four-leaved involucre; calyx one-leaved, urceolate, two-flowered; corolla none; styles two; capsules two, surrounded at base by calyx, one-celled, many-seeded.

**PLATANUS.** Male, a globose catkin; calyx none; corolla scarcely any; anthers growing about the filament. Female, a globose catkin; calyx many-leaved; corolla none; styles with a recurved stigma; seeds roundish, mucronate with the style, papose at base.

**ARUM.** Spatha of one leaf, convolute at the base; perianthium none; spadix with germen at the base; stem (sessile) near the middle of the spadix, which is naked above; berry one-celled, one-seeded.

#### ORDER VIII. MONADELPHIA. *Stamens united into a single body.*

**ARECA.** Common spatha two-valved. Male: calyx three-parted; petals three; stamens six, cohering at base. Female: calyx three-leaved; petals three; nectary six-toothed; styles three, very short; drupe one-seeded.

**PINUS.** Male: anthers two-celled. Female: scales in a conical cone, bracteate at base, digynous; pericarps attached to the inside of scale, more or less winged, deciduous; stigmas two or three-fid; cotyledons from four to eight.

**ABIES.** The same as *Larix*, excepting its habit and stigma, which is that of *Pinus*; cotyledons from three to nine.

**LARIX.** Male: anthers two-celled. Female: scales imbricated in a round cone, bracteate at base, digynous; pericarps attached to inside of scale, winged, deciduous; stigma hemispherical, cupped, glandular; cotyledons from five to nine.

**CUPRESSUS.** Male, an imbricated catkin; calyx a scale; corolla none; anthers four, sessile, without filaments. Female, a cone-like catkin; calyx a one-flowered scale; corolla none; stigma two concave dots; nut angular.

**THUJA.** Male, an imbricated catkin; calyx a scale; petals four; anthers four. Female, a cone-like catkin; calyx a two-flowered scale; corolla none; nut one, surrounded by an edged wing.

## CLASS XXII.—DICECIA.

*Male and female flowers upon different plants.*ORDER II. DIANDRIA. *Two Stamens.*

**SALIX.** Barren flower: scales of the catkin single-flowered, imbricated, with a nectariferous gland at its base; perianthium none; stamens from one to five. Fertile flower: scales of the catkin single-flowered; perianthium none; stigmas two, often cleft; capsule one-celled, two-valved, many-seeded; seeds comose.

ORDER III. TRIANDRIA. *Three Stamens.*

**EMPETRUM.** Barren flower: calyx tripartite; corolla of three petals; stamens three, upon long filaments. Fertile flower: calix tripartite; corolla of three petals; style very short; stigma with from six to nine rays; berry superior, globose, with from six to nine seeds.

ORDER IV. TETRANDRIA. *Four Stamens.*

**MYRICA.** Barren flower: scales of the catkin concave; perianthium none. Fertile flower: scales of the catkin concave; perianthium none; styles two; drupe one-celled, one-seeded.

ORDER V. PENTANDRIA. *Five Stamens.*

**ACNIDA.** Male: calyx five-parted; corolla none. Female: calyx three-parted; styles none; stigmas three, sessile; capsule one-seeded.

**HUMULUS.** Barren flower: perianthium single, of five leaves; anthers with two pores at the extremity. Fertile flower: scales of the catkin large, persistent, concave, entire, single-flowered; perianthium none; styles two; seed one.

ORDER VI. HEXANDRIA. *Six Stamens.*

**SMILAX.** Calyx five-leaved; corolla none; styles three; berry three-celled; seeds two.

ORDER VII. OCTANDRIA. *Eight Stamens.*

**POPULUS.** Barren flower: scales of the catkin lacerated; anthers from eight to thirty, arising from a turbinate, oblique, entire, single perianthium. Fertile flower: scales of the catkin lacerated; perianthium turbinate, entire; stigmas four; capsule superior, two-celled, two-valved, many-seeded; seeds comose.

ORDER IX. DECANDRIA. *Ten Stamens.*

**GYMNOCLADUS.** Calyx five-toothed; petals five; style one; legumen one-celled, pulpy inside.

ORDER XIII. MONADELPHIA. *Stamens united into one body.*

**JUNIPERUS.** Barren flower: scales of the catkin subpeltate; perianthium none; stamens from four to eight, one-celled. Fertile flower: scales of the catkin few, united at length, fleshy, and surrounding the three-seeded berry.

## CLASS XXIII.—POLYGAMIA.

*Flowers either male, female, or hermaphrodite, upon the same or different plants.*

## ORDER I. MONOGIA.

*Flowers different on the same plant.*

**VERATRUM.** Hermaphrodite: calyx none; corolla six-petalous; stamens six; ovaries three; capsules three, many-seeded. Male: same as hermaphrodite, but no ovary.

**HOLCUS.** Hermaphrodite: calyx glume, one or two-flowered; paleæ bearded under the end; stamens three; styles two; seed one. Male: calyx glume, two-valved; paleæ none or two; stamens three.

**ATRIPLEX.** Perfect flower: perianthium single, five-partite, inferior; stamens five; style bipartite; fruit depressed, one-seeded, covered by the calyx. Pistilliferous flower: perianthium single, two-partite; stamens none; the rest as in the perfect flower.

**ACER.** Hermaphrodite: calyx five-fid; corolla five petals; stamens eight; styles two; samara winged at the end, one-seeded. Male: calyx five-fid; corolla five petals; stamens eight.

**CELTIS.** Hermaphrodite: calyx five-parted; corolla none; stamens five; styles two; a drupe. Male: calyx six-parted; corolla none; stamens six.

## ORDER II. DIGECIA.

*Male and female flowers on different plants.*

**GLEDITSCHIA.** Hermaphrodite: calyx four-fid; corolla four petals; stamens six; a pod. Male: calyx three-leaved; petals three; stamens six. Female: calyx five-leaved; petals five; a pod.

**FRAXINUS.** Hermaphrodite: calyx none or four-parted; corolla none or four petals; stamens two; samara one-seeded. Female: calyx none or four-parted; corolla none or four petals; samara one-seeded.

**DIOSPYRUS.** Hermaphrodite: calyx and corolla four-fid; stamens eight; style four-fid; berry eight-seeded. Male: calyx and corolla four-fid; stamens eight.

**NYSSA.** Hermaphrodite: calyx five-parted; corolla none; stamens five; ovary one; drupe inferior. Male: calyx five-parted; corolla none; stamens ten.

**PANAX.** Hermaphrodite: an umbel; calyx five-fid; petals five; stamens five; styles two; berry two-seeded. Male: an umbel; calyx entire; petals five; stamens five.

**FIGUS.** Common receptacle turbinate, closed, fleshy. Female: calyx five-parted; corolla none; ovary one; seed one. Male: calyx three-parted; corolla none; stamens three.

## CLASS XXIV.—CRYPTOGAMIA.

*Sexual organs hidden; either imperfect or not existing.*

This class is the most difficult of any, quite too much so for young beginners, and on this account only one species will be given here, viz:

**EQUISETACEÆ.** Reproductive organs uniform, in terminal spikes, composed of peltate, several-aided scales, producing on their under surface from four to seven elongated involucre containing the seeds; branches whorled, rigid.

The young botanist will derive much pleasure in examining Ferns, Mosses, &c., which all belong to this class, and most of which are extremely beautiful. But until considerable progress is made in the science, there would be little use in attempting to make them the subject of rigid botanical study.



# DICTIONARY OF PLANTS.

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The first number placed after the name of a genus refers to the Class, and the second to the Order of the Linnean system.

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## ABI

**A'BIES.** Fir. 21—8.

**A. AL'BA, White Spruce:** an ever-green tree, common in the northern



states and throughout the northern part of the continent, but rarely met with south of Massachusetts, except in cold and humid situations. It reaches the height of about fifty feet in favorable situations, with a trunk of about a foot and a half diameter, two or three feet from the ground. Its trunk is straight, and tapers regularly to the top. Bark rather light

## ABI

colored; leaves pale green, thinly scattered, encompassing the branches, four-cornered, curved inwards toward the branch; cones small, about two-thirds of an inch in length; the scales thin, entire; blossoms in May or June; seeds ripe about the end of autumn. The general form of the tree is that of rather a slender pyramid.

The timber of this tree, which is light, strong, and elastic, is used for rafters and spars, and for young archers makes tolerable bows. As fuel, it makes a hot fire but a dirty hearth, snapping much in burning. The tough fibres of the roots, after being macerated in water, are used by the Indians for sewing the birch bark of their canoes. The bark is sometimes used for tanning. The resin is used sometimes medicinally

for stimulating or strengthening plasters.

**A. BALSAMICA, Silver Fir:** an evergreen of similar habit and locality with the white spruce, and about the same size, or rather smaller. Bark smooth and delicate; leaves rather more than half an inch long, growing singly on the sides and top of the branches, narrow, flat, upper side bright green, lower silvery white; cones four or five inches long, oval, the scales loose, entire; flowers in May.

The wood of this tree is not much used as timber. A resin or balsam is found in little cells in the bark, which is valuable as a medicine; and from this, the tree is often known by the name of *Fir Balsam* and *Balm of Gilead*: the latter is also a name of the Balsam Poplar. It is a very beautiful tree, the branches growing gradually shorter to the top and forming a handsome regular pyramid.

**A. CANADENSIS, Hemlock Spruce:** an evergreen, sometimes reaching seventy or eighty feet in height, of similar habit and locality with the last. The larger trees are three feet or more in diameter, preserving nearly the same size for twenty or twenty-five feet from the ground.

Bark of a grayish color, becoming lighter and covered with moss as



the tree grows old; leaves half an inch or more in length, standing thickly in two regular ranks, one on each side of the branch; cones oval, small, not much longer than the leaves, terminating the branches; flowers in May. When twenty or thirty feet high, it is a handsome tree.

This tree is not much esteemed for timber, though for rough work, that is not to be exposed to the weather, it is a tolerable substitute for white pine. The bark, with the outer part of the epidermis shaved off, is much used for tanning.

**A. NIGRA, Black Spruce:** an evergreen, reaching seventy or eighty feet, disseminated much as the others. It sometimes forms large forests, covering some of our mountains in thick dark masses. Bark smooth; limbs spreading horizontally, and becoming gradually shorter to the top, which terminates in an annual shoot, the whole forming a beautiful

regular pyramid; leaves dark green, solitary, four-cornered, straight, nu-



merous, thickly covering the branch, from which it is often called Double Spruce; cones small, oval, reddish, pointing downwards, the scales elliptical, wavy at the edge, erect. Flowers in May.

The distinguishing properties of the wood of black spruce are strength, lightness and elasticity. It furnishes the best yards and topmasts that can be used. The red variety is superior in size to the other, which grows in a poorer soil, and is less supple and more liable to be crooked. The knees of vessels are frequently of black spruce where the oak is rare. When these pieces are of oak, they are formed of two limbs united at the base; but when of spruce, they are made from the base of the trunk and one of the principal roots. It is often used for the rafters of houses, and is more esteemed than the hemlock spruce. It is some-

times sawn into boards of considerable width, which are less valuable than those of white pine. Sometimes they are used for floors, but they are liable to crack. The red spruce is sometimes employed for the staves of fish casks. With the young branches, especially those of the black spruce, is made the salutary drink known by the name of *Spruce Beer*, which in long voyages is found an efficacious preventive of the scurvy. The twigs are boiled in water, a small quantity of molasses or maple sugar is added, and the mixture is left to ferment. The essence of spruce is obtained by evaporating, to the consistence of an extract, water in which the summits of the young branches have been boiled. This species is not resinous enough to afford turpentine as an article of commerce. The wood is filled with air, and snaps in burning like chestnut.

These are to us the most important species. There are besides *ABIES FRASE'RI*, *Double Balsam*, of Pennsylvania; *ABIES PIC'CA*, *Silver Fir*, of Germany; *ABIES ORIENTA'LIS*, *Oriental Fir*; *ABIES CLANBRASILIA'NA*, *Clanbrazil Fir*, of Asia; and *ABIES COMMUNIS*, *Norway Spruce*, of North Europe.

that little accords with our ideas of sugar making and refining; yet this is the *sugar-house* of the northern farmer, and here is manufactured the most delicious sweet that ever meets the palate. If we renew our visit in February or March, the place wears a different aspect. A large kettle is now suspended from the pole over the fire-place, filled with the boiling sap, and a brisk fire is burning underneath. The boys bring in the sap in pails from the trees, where it is collected in clean wooden troughs by means of spouts stuck two or three in each trunk; the old farmer superintends the boiling operations, and if he is good-natured, gives us a tin dish-full from the kettle in the state of molasses, the smell of which hardly leaves us patience to wait for its cooling; the whole scene wearing an enlivening air of business and profit. Four gallons of sap are generally found to produce one pound of sugar: Thirty-three pounds of sugar have been made from a single tree in one season.

A. STRI'ATUM, *Striped Maple*; *Moose Wood*: leaves cordate, 3-fid, smooth; racemes simple, long, pendulous; branches striated; flowers green; May; height about ten feet.

This is a beautiful little species,

common in Nova Scotia, New Brunswick and the northeasterly part of the United States. Farther south, it is confined to cool mountainous situations, and may be found as far as Georgia. The bark is green and smooth throughout, and marked longitudinally with black stripes, whence the name. It is too small for timber. The wood, which is fine grained and white, is sometimes substituted for holly. Cattle, are extremely fond of browsing on its young branches. It is used in ornamental gardening, and in Europe has been grafted on the sycamore, where it has attained four times its usual size.

The other species are ACER BARBA'TUM, *Bearded Maple*; ACER NIGRUM, *Black Maple*; ACER SPICA'TUM, *Mountain Maple-bush*; ACER NEGUNDO, *Ash Maple*, *Box Elder*; ACER MACROPHYL'LUM, *American*; ACER HETEROPHYL'LUM, *Ever-green Maple*, *Asiatic*; ACER PSEU'DO-PLA'TANUS, *Sycamore*; ACER PLATANOIDES, *Norway Maple*, *European*.

The Maples are handsome trees, and when standing alone exhibit a symmetrical and somewhat oval-shaped summit, with beautiful and highly characteristic leaves, unlike those of any of our other forest trees.

With the hard frosts of autumn, the successive tints which they assume are unrivalled among the brilliant dyes, so conspicuous in our autumn scenery.

**ACHILLEA.** *Milfoil.* 19—2. Common, calyx egg-shaped, imbricated, with several egg-shaped, acute, close scales; compound corolla rayed; florets of the disk perfect, tubular, with five equal spreading segments; those of the ray from five to ten, flat, roundish, inversely heart-shaped, with a small intermediate lobe; filaments hair-like, very short; anthers united into a cylindrical tube; germen small, inversely heart-shaped; style thread-shaped, as long as the stamens; stigmas obtuse, spreading; seed inversely egg-shaped, abrupt; seed-down none; receptacle narrow, covered with lance-shaped, chaffy scales.

**A. MILLEFOLIUM,** *Yarrow:* leaves alternate, bipinnate, slightly hairy, the segments linear, toothed, mucronate; stems furrowed; flowers white, in an erect, flat-topped, crowded corymb; calyx furrowed, ovate, disk convex; florets of the ray four or five; stem erect; flowers in July and August; height about fifteen inches; perennial.

This is a humble but pretty plant,

very common in dry soils. It has a rather pleasant pungent taste and smell, and the root has a place among country specifics for the toothache. I never tried it.

**A. PTARMICA,** *Sneezewort:* leaves linear, acuminate, equally and sharply serrate, glabrous; flowers white, August; height twelve inches; found in moist places. The leaves, dried and pulverized, provoke sneezing, whence the name. A double variety of this species very handsome.

**A. ASPLENIFOLIA,** *Rose-colored Milfoil:* radical leaves, twice pinatifid, cauline ones gashed; divisions ovate, serrate, mucronate, obtuse; stem branched, fastigate, smooth; flowers pink, July and August; height eighteen inches. Found in the southern states.

There are more than fifty species in this genus, which is named after Achilles, a Grecian chief and physician, who is supposed to have first employed it in healing wounds. Gerard says "it is a principall herbe for all kinde of bleedings, and to heale up new and old ulcers and greene woundes."

**ACNIDA.** 22—5.

**A. CANNABINA,** *Sea Hemp:* leaves lanceolate; capsules smoothish,

acute-angular; flowers terminal in leafy spikes; flowers green, July; height three feet. Found on sea and inland marshes.

**ACONITUM.** 13—3. Calyx none; petals five, inferior, unequal, four of them in pairs, opposite; the upper one hooded, or tubular, inverted, the convex part being uppermost, the deflected point recurved; two lateral ones roundish, opposite, converging; two lowermost oblong, deflected. Nectaries two, within the hollow of the upper petal, on long, awl-shaped stalks, tubular, oblique at the orifice; filaments numerous, broad at the base, awl-shaped, short; anthers roundish, erect; germen superior, from three to five, oblong; styles terminal, awl-shaped, spreading; stigmas simple, acute; follicles straight, oblong, one-valved; seeds numerous, angular, arranged at the edges of the capsule.

**A. NAFEL'US**, *Monk's Hood*: upper petal arched at the back; lateral ones hairy at the inner side; germen three, smooth; leaves deeply five-cleft, cut, with linear segments, furrowed above; stem erect, leafy, simple, terminating in a cluster of dark blue flowers; perennial; flowers in July; height two feet.

**A. UNCINATUM**, *American Wolf's-*

*bane*; *Monk's Hood*: panicles lax; branches diverging; helmet exactly conical; leaves three-lobed, with entire lobes; ovaries villous; flowers blue, July and August; height two feet. Cultivated at the south.

The species of this genus are very numerous, and its limits undetermined. The plants are all highly poisonous. The roots of *A. napellus* resemble little turnips, and people have died by eating them through mistake. It is even dangerous to smell the plant when in full bloom. "They say that it is of such force, that if a man be wounded with an arrow or other instrument dipped in the juice hereof, they die within halfe an houre after, remediesse." (Gerard's Herbal.) It is used in medicine.

**A'CORUS.** 6—1. Calyx none; spadix naked, cylindrical, simple, covered with sessile flowers; petals six, inferior, equal, obtuse, concave; filaments thickish, erect, a little longer than the petals; anthers thick, terminal, twice lobed; germen superior, oblong, as long as the stamens; style none; stigma hemispherical; capsule triangular, abrupt; 3-celled; seeds several, between egg-shaped and oblong.

**A. CALAMUS**, *Sweet Flag*: leaves

erect; summit of the flower-stalk rising far above the spadix; flowers crowded, pale green, June, July; height two or three feet. This is a very common plant in all parts of the United States, and is much thought of. A piece of *flag-root* is always in demand with the young ones, and schoolboys can generally barter a pocket full for playthings and such light articles of traffic as happen to be in their line. The whole plant is aromatic, especially the root. With us, all plants with long sword-shaped leaves are called flags; this may be readily distinguished by a smooth ridge or rib running the whole length of the leaves through the centre, and by the spadix projecting from the side of the flower-stalk, which is similar to the leaves, but not quite so high. No cattle eat this plant. Its warm, pungent root has always been in considerable estimation in medicine. "The root of this preserved is very pleasant to the taste and comfortable to the stomach and heart." (*Herbel.*) Found in wet places, but in firm soils. Perennial.

ACTÆA. 13—1. Calyx inferior, of four circular, obtuse, caducous leaves; petals four, oblong, clawed, deciduous; filaments about thirty,

hair-like, broader towards the top; anthers roundish, two-lobed; germs egg-shaped; style none; stigma thickish, obliquely depressed; berry globular, smooth, with a lateral furrow; one-celled, not bursting; seeds numerous, nearly flat, arranged in two rows.

A. SPICA'TA, *Baneberry*; *Red Actæa*: stem smooth, roundish; berries



ovate, oblong, red, shining, poisonous; petals shorter than the stamens; leaves bi-triternate; leaflets heart-shaped, cut-toothed, hairy beneath; raceme hemispherical; peduncles round, smooth; flowers red; May; height two or three feet; found in woods; a bad smelling, disagreeable plant.

A. AL'BA, *White Actæa*: berries roundish, purplish, black, poisonous; petals long as the stamens; raceme

ovate; leaves 2 or 3-ternate; leaflets egg-shaped, acutely serrate, deep-green; flowers in a close cluster, with white petals; May, June; root creeping; stem triangular, two or three feet high; found in woods and shady places. It is fœtid and disagreeable.

#### AGAVE. 6—1.

*A. AMERICA'NA*, *Common American Agave*; *great American Aloe*; stemless; leaves toothed, spiny; scape branched; tube of corol contracted in the middle; stem longer than corol; flowers yellow; August, October; height twenty feet. This magnificent plant is not indigenous in any part of the United States, but is found farther south. This species grows wild in the south of Europe, and is much used in Italy, planted in vases as an ornament to piers, parapets, and about houses. In Milan and other towns in Lombardy, where it will not endure the winter, it is thought so much of that they use imitations of copper, so well formed and painted, as to be mistaken for the plant itself. It is sometimes called the *Century Plant*, because it was supposed to flower but once, and that after a period of a hundred years, which having accomplished, it immediately died. It has

been found, however, to flower sooner or later according to the culture bestowed on it. A preparation is said to be made from the leaves, which is a good substitute for soap.

*A. VIRGINICA*, *Virginian Agave*: stemless; leaves cartilaginous, sawed; scape simple; flowers purple and green; height four to six feet; grows on the banks of rivers.

*AGRIMONIA*. 11—2. Calyx inferior, of one leaf, tubular, permanent, with five small marginal segments; petals five, flat, notched; filaments hair-like, shorter than the corolla, varying in number; anthers small, two-lobed, compressed; germens egg-shaped, compressed, in the bottom of the calyx; styles as long as the stamens, lateral; stigma obtuse, undivided; seeds generally two, egg-shaped, compressed, pointed, smooth, inclosed in the hardened tube of the calyx.

*A. EUPATORIA*, *Agrimony*: calyx inferior, of one leaf, tubular, permanent, with five small marginal segments; petals flat, notched, inserted in the calyx; filaments hair-like, shorter than the corolla; anthers small, two-lobed, compressed; styles as long as the stamens, lateral; seeds inclosed in the hardened tube of the calyx; flowers yellow, very



numerous, tapering to a spike, June, July; height one or two feet. This plant is common throughout the United States. It grows by roadsides, and the margins of fields, and thickets. It is slightly bitter, aromatic, astringent, tonic, and was formerly in great repute for its medicinal properties. Gerard says "the decoction of the leaues is good for them that haue naughty liuers, and for such as are bitten with serpents." The root in spring is sweet-scented, and the fresh gathered flowers smell like ripe apricots. When the plant is coming into flower, it will dye wool a full nankeen color, and gathered in autumn, a darker yellow.

There are other American species, as *A. pavriflora* with small yellow flowers; *A. striata*, with white flowers; and *A. suaveolans*, which grows to the height of five feet.

**ALCHEMILLA.** 4—1. Calyx inferior, of one leaf, tubular, permanent; limb divided into eight segments, the four outer alternate ones smaller; corolla none; filaments awl-shaped, erect, small, standing on the mouth of calyx; anthers roundish; germen egg-shaped, in the bottom of the calyx; style thread-shaped, as long as the stamens,

standing on the base of the germen; stigma knobbed; seed one, oval, compressed.

*A. ALPINA*, *Alpine Lady's Mantle*: leaves with finger-like divisions, silky on the back; leaves divided into five or seven elliptical or inversely egg-shaped lobes, serrated towards the extremity, and covered with a beautiful silky down on the back; perennial; flowers in July; grows on the high mountains of New Hampshire.

*ALISMA.* Water Plantain. 6—4. Calyx inferior, of three egg-shaped, permanent leaves; petals three, roundish, much larger than the calyx, deciduous; filaments awl-shaped, short; anthers roundish; germens superior, more than five; styles simple; stigmas blunt; capsules more than five, compressed; seeds small, solitary.

*A. PLANTAGO*, *Water Plantain*:



leaves all radical, on long stalks,

erect, ovate, acute, bluntly three-cornered; root fibrous; flower-stalk two or three feet high, paniced; flowers terminal, solitary, pale, purplish; July; found in ditches, pools, and rivers; common.

AL'L'IUM. Garlic. 6—1. Calyx none; petals six, inferior, oblong, regular, the three inner somewhat smaller; filaments awl-shaped, flattened, as long as the corolla; anthers solitary, oblong; germen superior, turbinate, angular; style simple, erect; stigma acute; capsule three-lobed, three-celled, three-valved; seeds few, roundish, angular.

A. CANADENSE, *Canadian Garlic*: scape naked, rounded; leaves linear, head bearing bulbs; leaves radical, smooth, channelled above; spathe ovate, acute; they support a head of bulbs with a leaf under each, and a few whitish flowers; height six inches; found in woods; flowers in June; perennial.

A. TRICOCCUM, *Three Seeded Garlic*: scape smooth, half round; leaves lanceolate, oblong, flat, smooth; umbel globose; seeds solitary; flowers white; July; height six inches.

There are many species of Allium, among which are onions of several kinds and garden chives, well known

pot herbs. They are characterized by a hot quality, and pungent, penetrating smell. They are all edible, and some of them of the greatest antiquity as pot herbs. "We remember the fish which we did eat in Egypt freely; the cucumbers, and the melons, and the leeks, and the garlic." Num. xi. 5. The onion is not only in universal estimation as an article of food, but holds a high rank among the numerous remedies prescribed for colds, yet "it heateth the body, ingendreth naughty bloud, causeth troublesome and terrible dreames, offendeth the eies, dulleth the sight, hurteth those that are by nature hot and cholericke, and is noysome to the stomacke."

AL'NUS. Alder. 21—4. Barren flowers numerous, in a loose cylindrical catkin, imbricated all round; calyx a wedge-shaped scale, three-flowered, with two very minute lateral scales; corolla of three equal florets, attached to the inner side of each scale, each of one petal, deeply divided into four equal, egg-shaped, obtuse segments; filaments four, arising from the tube of the corolla, shorter than its segments; anthers roundish, two-lobed.

Fertile flowers fewer, in an oval catkin, imbricated all round; calyx

a wedge-shaped, two-flowered scale; corolla none; germen compressed, two-celled; styles two, parallel, bristle-shaped, deciduous; stigma simple; nut egg-shaped, hard, compressed, angular, two-celled; kernel solitary, egg-shaped, acute.

*A. SERRULATA*, *Common Alder*: leaves obovate, acuminate; the



veins and their axils hairy underneath; stipules elliptical, blunt; flowers in March and April; height eight or ten feet.

The alder is common in the northern, middle, and western states; growing in thick clumps on the sides of brooks and rivers, and forming large thickets about ponds, or places covered with stagnant water.

*ALTHÆA*. Marsh-Mallow. 16

—7. Calyx inferior, double, permanent; the outer smaller, of one leaf deeply divided into nine segments; the inner of one leaf, divided into five segments; petals five, inversely heart-shaped, flat, with broad claws,

attached to the bottom of the tube formed by the stamens; filaments numerous, hair-like, united below into a tube; anthers nearly kidney-shaped; germen round, depressed; style cylindrical, as long as the tube of the filaments; stigmas about twenty, bristle-shaped, nearly as long as the style; capsules about twenty, compressed, arranged in a circle round the columnar receptacle, each two-valved and one-celled; seeds solitary, kidney-shaped, compressed.

*A. OFFICINALIS*, *Marsh-Mallow*: stem erect, firm, covered with thick woolly down; leaves alternate, soft, downy on each side, cordate or ovate, toothed, undivided or 3-lobed; peduncle axillary, many flowered, terminal; calyx downy; flowers flesh-colored, July to September; height six feet; found in salt marshes. A mucilaginous plant, used in medicine.

The beautiful *hollyhock* and its numerous varieties, so common in gardens, is the *A. rosea*. *Althæa* comprises several species, none of which are supposed to be native.

*AMARANTHUS*. *Amaranth*. 21—5. Barren flowers; calyx of three or five erect, lance-shaped, colored leaves; corolla none; fila-

ments three or five, hair-like, erect, as long as the calyx; anthers oblong, two-lobed.

Fertile flowers in the same cluster; calyx of three or five erect, lance-shaped, colored leaves; corolla none; germen superior, egg-shaped; styles three, sometimes two; stigma acute, downy on the upper side; capsule egg-shaped, one-celled; seed solitary, globular, filling the capsule.

*A. HYBRIDUS*, *Hybrid Amaranth*: racemes decoumpound, clustered,



erect, axillary, terminal; leaves ovate-lanceolate. A common weed, with an erect, hairy, furrowed stem, and alternate leaves on long petioles, ovate, mostly entire, mucronated, the lower ones retuse at the end. The flowers are crowded, the male

and female in the same cluster; as the plant grows old they turn to a dull reddish color; June to September; height three or four feet; annual.

*A. ELI'TUM*, *Low Amaranth*: clusters somewhat spiked, flowers three-leaved; leaves ovate, retuse; stem diffuse; flowers green; June to August; height two feet. A small spreading or prostrate plant; annual.

There are numerous species of *Amaranthus*, some of which are cultivated in Europe and are very ornamental. Our gardens also afford some beautiful species, as the *A. hypochondriacus*, *Prince's Feather*, which, as Millar says, is as handsome a plant as the garden can boast. They are generally very prolific in seeds, which retain their germinating quality for many years.

*AMYGDALUS*. Almond. 12—1.

*A. PERSICA*, *Common Peach*: leaves with all the serratures acute; flowers sessile, solitary; May; height about fifteen feet. A description of the peach tree would be superfluous; we are all so familiar with its appearance, that we immediately recognise a single leaf, the flower, the naked branch, or even a piece of the bark; and we also know

how grateful the fruit is to the palate. There are, however, two vari-



eties of this species worthy remark, the *nectarine*, on account of the super-excellence of its fruit, and the *double-flowering*, on account of its great beauty. There is no fruit in the world, not even the far-famed pine-apple, that can compete with the juicy and exquisitely delicious pulp of the nectarine. The flowers of the double-flowering variety are of the most beautiful reddish or blush color, and large as the smaller kinds of roses.

You have no doubt noticed the resemblance of almonds to peach-stones; they belong to the same genus or family with the peach.

ANAGALLIS. Pimpernel. 5—  
1. Calyx inferior, of one leaf, deep-

ly divided into five acute, spreading segments, permanent; corolla of one petal, wheel-shaped, without a tube, the limb nearly flat, divided into five egg-shaped segments; filaments slender, erect, shorter than the corolla, covered with glandular hairs; anthers heart-shaped; germs globular; style thread-shaped; stigma knobbed; capsule round, one-celled, splitting across into two valves; seeds numerous, angular.

A. ARVEN'SIS, *Scarlet Pimpernel*: stem procumbent; leaves ovate, dotted beneath; corolla minutely notched; stem branched, square; leaves sessile; corolla scarlet, with a violet colored mouth; capsule spherical, one-celled, splitting across into two valves; seed numerous, angular; June to September; height six inches. A beautiful little trailing plant, and one of Flora's timepieces, opening its flowers about eight o'clock and closing them about two. It also serves as a hygrometer, for if rain fall, or there be much moisture in the atmosphere, the flowers either do not open, or soon close up again. On this account it has been called "the poor man's weather-glass." Small birds are very fond of the seeds.

ANDROMEDA. 10—1. Calyx

inferior, small, colored, permanent, deeply divided into five acute segments; corolla of one petal, egg-shaped or bell-shaped; the limb with five reflected segments; filaments awl-shaped, shorter than the corolla; anthers two-celled, opening by two terminal pores, and surmounted by two horns; germen roundish; style cylindrical, longer than the stamens, permanent; stigma obtuse; capsule roundish, five-cornered, five-celled, five-valved, with partitions from the centre of the valves; seeds numerous, roundish.

**A. HYPNÓIDES, Mossy Andromeda:** stems filiform, spreading; leaves imbricated, subulate, smooth; peduncle solitary, terminal; corolla globose, campanulate; flowers pink, June and July; height six inches. This is one of the smallest shrubs, a perfect tree in miniature. It is an evergreen, with its small leaves so thickly crowded as to conceal the stem; its flowers hanging from the erect terminal peduncle like little bells. It is confined to the high northern latitudes of both continents, and is rarely met with. Dr. Bigelow says its only locality, that he is acquainted with, is the summit of the White mountains, in

New Hampshire. It has the appearance of a moss, and spreads over large tracts of the cold northern mountains.

**A. POLIFÓLIA, Marsh Andromeda; Wild Rosemary:** leaves alternate,



linear-lanceolate, revolute, glaucous beneath; flowers pendulous, aggregate, terminal, globose; flowers rose-colored; June; height twelve inches. A beautiful and delicate little shrub, found by the side of ponds and in other wet places.

**A. ARBOREA, Sorrel-Tree:** panicles terminal; corolla rubescent; leaves elliptical, acuminate, tooth-letted. This is the only species of *Andromeda* which rises to a sufficient height to be ranked among forest trees. It begins to appear on the Alleghanies in Virginia, and is found to their termination in Georgia. It grows also in the southern states on

the steep banks of the rivers that flow from the mountains; but it be-



comes more rare in following them from their source, whether eastward or westward, and ceases entirely in the maritime parts of the Carolinas and Georgia.

It abounds in the fertile valleys at the foot of the lofty mountains of North Carolina, where they are found fifty feet in height and twelve or fifteen inches in diameter. This is an extraordinary size for a tree of this genus, which is very numerous in the Atlantic states, and three-fourths of whose species, to the number of eight or ten, rarely exceed six feet in height and an inch in diameter. The growth of the sorrel-tree is observed to be stunted in dry and gravelly lands, so that it presents itself in the form of a bush. The leaves are downy in the spring, but they become smooth and glabrous in acquiring their growth. They

are alternate, oval-acuminate, finely denticulated, and from four to five inches long. It puts forth small white flowers, from July to September, formed into spikes five or six inches long. United in groups, they have a fine effect, and render this tree very proper for the embellishment of gardens. The seeds are exceedingly minute, and are contained in small capsules.

On the trunk of the sorrel-tree the bark is thick and deeply furrowed. The wood is of a pale rose color and very soft. It burns with difficulty, and is wholly rejected in the arts. The acidity of the leaves has procured it the name of *Sorrel-Tree*. In drying they become black, and, when sumac is not to be obtained, they are used to impart color to wool.

There are numerous species of *Andromeda*, most of which are indigenous in the United States. They are generally small shrubs of so much beauty and delicacy, that they have been introduced into Europe, where they are cultivated and much thought of.

**ANEMONE.** 13—4. Calyx none; petals from five to fifteen, oblong, inferior, regular, in one or more rows; filaments numerous, hair-like, much shorter than the co-

rolla; anthers two-lobed; germens superior, numerous, collected into a roundish head; styles tapering, short; stigmas simple, blantish; seeds numerous, pointed, tipped with the permanent styles.

A. NEMOROSA, *Wood Anemone*: leaves ternate, with trifid, cut-toothed, lanceolate, acute-toothed segments; involucre stalked, similar; sepals six, elliptical; seeds pointed; stem one-flowered, erect, about a foot high; petals five or six, white, externally purplish; April, May. It is a very common plant, found in woods and thickets, and sometimes in the open fields about fences; perennial.

A. THALICTROIDES, *Meadow-rue-leaved Anemone*: flowers umbelled; floral leaves stalked, biternate, forming a sort of involucre; stem simple, erect; leaves compound, triternate; flowers white; April, May; height six inches; found in woods and pastures.

A. VIRGINIANA, *Virginian Anemone*: leaves ternate, with trifid, acuminate, cut-toothed segments; involucre stalked, similar; sepals five, elliptical; seeds in an oblong ovate head, woolly; stem erect, very straight, round, hairy, two or three feet high; peduncles long,

straight, erect; flowers terminal, white, solitary; styles numerous; June, July; found in woods.

Anemones are generally curious, pretty plants, which may be almost always found in woods, where the soil is light, airy, and not too much shaded, particularly where there is considerable variety in the growth of wood, with a mixture of Firs, &c.

ANGELICA. 5—2. Flowers all perfect, fertile and regular; calyx none; petals five, superior, equal, lance-shaped, flatish, with an inflected point, their base narrow; filaments thread-shaped, spreading, longer than the corolla; anthers roundish; germen egg-shaped, strongly furrowed; styles at first very short, erect, broad and tumid at the base, afterwards elongated and recurved; stigmas knobbed; floral receptacle thin, waved, ultimately projecting a little beyond the bases of the styles; fruit elliptical, slightly compressed, bordered, crowned with the floral receptacle and styles; seeds oblong, with three longitudinal wings, and a flat border; the interstices wrinkled.

A. ATROPURPUREA, *Common Angelica*: petiole three-parted, the divisions pinnate, five-leaved; leaflets cut-toothed, of the terminal ones,



the odd ones rhomboid, sessile, the lateral ones decursive; stem five or six feet high, more than an inch in diameter at the bottom, hollow, purplish, smooth, and in considerable demand among boys for the domestic manufacture of fifes, flutes, &c.; stipules large and swelling; petioles roundish, furrowed on the upper side; leaves mostly biternate, smooth, pale, veiny beneath, sharply serrate; umbels three, terminal, spherical, and without general involucre; partial stalks angular, with subulate involucre projecting a little beyond the bases of the styles; flowers purple; June; found in meadows.

This is a large and beautiful plant, with an agreeable aromatic taste and smell; it should, however, be sought with caution by inexperienced young botanists, as some of our poisonous plants have a general resemblance to it. Another species, *A. ARRHANGELICA*, is sometimes cultivated in gardens for its leaf stalks, which are blanched and eaten as celery or candied with sugar.

#### ANO'NA. 13—4.

*A. TRILO'BA*, *Pawpaw*. Leaves ovate, lanceolate, smooth; peduncles opposite the leaves, two-flowered. The *pawpaw* is seldom found

north of the river Schuylkill, and is extremely rare in the low, maritime parts of the southern states. It is not uncommon in the bottoms which stretch along the rivers of the middle states; but it is most abundant in the rich valleys intersected by the western waters, where at intervals it forms thickets exclusively occupying several acres. In Kentucky and in the western part of Tennessee, it is sometimes seen also in forests where the soil is luxuriantly fertile; of which its presence is an infallible proof.

It seldom exceeds thirty feet in height and a diameter of six or eight inches, though it generally stops short at half this elevation. The trunk is covered with a silver-gray bark, which is smooth and finely polished. The leaves are borne on short petioles, and are alternate, five or six inches in length, and of an elongated form, widening from the base to the summit. They are of a fine texture, and the superior surface is smooth and brilliant. The flowers, which are attached by short peduncles, are pendent, and of a purple hue. When the fruit is ripe, which takes place towards the beginning of August, it is about three inches long, one and a half

thick, of a yellowish color, and of an oval form, irregular and swelling into inequalities. Its pulp is soft and of an insipid taste, and it contains several large, triangular stones.

The wood is spongy, extremely soft, destitute of strength, and applicable to no use in the mechanical arts.

**ANTHE'MIS.** 19—2. Common calyx hemispherical, closely imbricated, with several oblong, nearly equal scales; compound corolla rayed; florets of the disk numerous, perfect, tubular, with five equal spreading segments; those of the ray numerous, strap-shaped, abrupt, three-toothed; filaments very short, hair-like; anthers united into a cylindrical tube; germens inversely egg-shaped; style thread-shaped, as long as the anthers; stigmas oblong, spreading; seed inversely egg-shaped, somewhat compressed, generally crowned with a slight border; receptacle convex, covered with lance-shaped chaffy scales.

**A. CO'TULA**, *May Weed*: leaves twice pinnatifid, smooth, with linear segments; receptacle conical, with bristle-shaped scales; seeds without a border; stem about a foot high, erect, bushy; leaves alternate, sessile; flowers solitary, on terminal

striated stalks; disk pale, greenish yellow; ray of a dozen or more



white florets; June to September. This is a very common plant by the sides of roads, on hard, dry soils, often occurring in large patches, covering the ground when in flower, like a white sheet. It is rather a disagreeable plant, of a strong unpleasant smell, acrid, and not to be handled much with impunity, as the eyes sometimes dearly pay for making too free with it. It generally has a place among the good wife's medical herbs, *May-weed tea* being a grand specific for *something*; I have forgotten what. The common garden *Camomile* is the *A. NO'BILIS*.

**APAR'GIA.** 19—1. Common calyx double; the inner oblong, imbricated, of several linear, parallel, unequal scales; the outer very small, of irregularly scattered scales; com-

pound corolla of numerous, imbricated, uniform, perfect, strap-shaped, abrupt, five-toothed florets; filaments hair-like, very short; anthers united into a cylindrical tube; germs oblong; style thread-shaped, longer than the anthers; stigmas two, recurved; seed oblong, striated; seed-down sessile, feathery, often scaly in the marginal seeds, sometimes a little stalked in the central ones; receptacle naked, or slightly hairy, dotted.

*A. AUTUMNALIS*, *Autumnal Hawkweed*: flower-stalk branched, the



partial stalks scaly, and swelled under the flowers; leaves lance-shaped, toothed, or pinnatifid, nearly smooth; root large, tapering; stalks from six inches to two feet high; leaves covered with scattered white hairs; flowers large, yellow; perennial; flowers in July and August; grows in pastures and mead-

ows, by waysides and on banks; common.

The flower of this hawkweed or hawkbit very much resembles that of the dandelion, being of the same color and shape, but rather less.

*APOCYNUM*. 5—2.

*A. ANDROSAEMIFOLIUM*, *Dog's Bane*. Stem erect, herbaceous,



branching; leaves ovate, smooth on both sides; cymes lateral, terminal, smooth, paler beneath; stalk smooth, simple, repeatedly branched at top; calyx 5-fid, acute, much shorter than the corolla; corolla white, striped with red, with five acute spreading segments; stamens with short filaments, with oblong, arrow-shaped anthers, joined to the middle of the stigma; nectary consisting of five oblong glandular bodies; germs two, ovate; flowers in June, July; found on dry soils, by roads and fences; perennial.

**A. CANNABINUM**, *Indian Hemp*: stem erect, smooth, branching, herbaceous; leaves opposite, oblong, tomentose beneath; cymes lateral and terminal, longer than the leaves; corolla small, narrow, the segments erect; flowers white, June to September; height about three feet; perennial; found in woods and on the margins of meadows. The Indians make their twine, bags, fishing-nets and lines, from the bark of this plant, the fibres of which are strong and pliable.

**AQUILEGIA**. 13—4. Calyx none; petals five, inferior, egg-shaped, equal, spreading; nectaries five, equal, alternate with the petals, tubular, dilated upwards, oblique at the mouth, the outer margin ascending, the inner attached to the receptacle; their lower portion extended into a long tapering spur, obtuse at the end; filaments from thirty to forty, awl-shaped, the outer shorter, the inner abortive, dilated, clasping the germens; anthers heart-shaped, erect; germens five, superior, oblong, each tapering into an awl-shaped, erect style; stigmas simple; follicles five, cylindrical, pointed, straight, one-valved; seeds numerous, egg-shaped, smooth, arranged along the edges of the follicle.

**A. CANADENSIS**, *Wild Columbine*: spurs straight; styles and stamens



exserted; sepals acute, a little longer than the petals; segments of leaves 3-parted; stem erect, branching; leaves ternate and biternate, lobed; flowers terminal, pendulous, deep-scarlet without and light palish yellow within; stamens projecting beyond the petals; filaments from thirty to forty; anthers oval; germs oblong, acute; as the seeds ripen, erect with hooked awns; styles filiform; flowers in May; height about twelve inches. A very common and interesting little plant, much handsomer than the cultivated species. It is among our earliest flowering wild plants, and may always be found on dry hills and rocks before vegetation generally shows any signs of returning spring. It is sometimes called *Honey-suckle*.

**A. RABIS**. Wall Cress. 15. Calyx of four oblong, converging, erect, deciduous leaves, two opposite

ones somewhat larger, and protuberant at the base; petals oblong, undivided, spreading, tapering into broadish claws, hardly so long as the calyx; filaments thread-shaped, erect, generally with four glands at their base externally; anthers heart-shaped; germen linear; style very short; stigma obtuse; pod linear, compressed; its valves nearly flat, ribbed or veined, slightly undulated by the seeds; partition linear, membranous; seeds in one row, oval or round, compressed.

A. *THALIA'NA*, *Common Wall Cress*: flowers in May; annual; grows on dry sandy hills; leaves hairy, toothed; root-leaves stalked, oblong, the rest sessile; about two feet high, branched; flowers small, white, corymbose.

A. *SAGGITTATA*, *Sagittate Wall Cress*: leaves somewhat toothed, rough, radical ones ovate or oblong, narrowed into the stem; cauline ones lanceolate, sagittate, cordate; stem erect, simple, straight, about eighteen inches high; flowers small, white; June; annual; grows on dry sandy hills.

A. *LYRATA*, *Lyrate Wall Cress*: radical leaves lyrate, pinnatifid, smooth or ciliated; cauline ones linear; stem branched, hispid at the

base, about a foot high; flowers large, white; June, July; perennial; grows on rocky hills.

ARA' LIA. 5—5.

A. *NUDICAULIS*, *Wild Sarsaparilla*: stemless; leaves decomposed; scape leafless; leaves three-cleft, the leaflets subdivided into three or five oblong-ovate leaflets, serrate, acuminate, veined, and slightly hispid; flower-stalk rising from the centre, terminated by umbels of greenish white flowers; petals centrally nerved, acute, reflexed; stamens whitish, erect; flowers in May, June; found in woods, in rich soils, where the growth is generally oak, most abundant in rocky places; perennial. The roots of this plant are aromatic, with a sweetish bitter taste, and are used with checkerberry, yellow dock-root, and a long list of other simples, in the concoction of a kind of syrup or diet-drink, of vast efficacy in that complication of all disorders which is so often detailed; descanted and advised upon, over a social cup of hyson, after the common scandal of the neighborhood becomes fairly exhausted.

A. *RACEMOSA*, *Pettymorrel, Spike-nard*: stem herbaceous, smooth; leaves decomposed; peduncles axillary, branching, umbelled; stem

smooth, dark-green, or inclining to red; leaflets large, ovate, serrate; axils divided into branching racemes; flowers white; June, July; found in situations similar to the last; height two to four feet. It is aromatic, of a pleasant taste, and an indispensable ingredient in the *diet-drink*.

All the plants of this genus are interesting. *A. SPINOSA*, *Virginian Angelica-tree*, grows to the height of eight to twelve feet.

**ARBUTUS.** 10—1. Calyx inferior, of one leaf, small, divided into five obtuse segments; corolla of one petal, egg-shaped, transparent at the base, the limb with five small, recurved segments; filaments awl-shaped, swelling in the middle, half as long as the corolla; anthers two-celled, opening by two terminal pores, and bearing two short horns; germen superior, roundish, sitting upon a ten-dotted receptacle; style cylindrical, as long as the corolla; stigma rather thick and blunt; berry roundish, five-celled; seeds small, angular, bony.

*A. UVA-URSI*, *Bear Berry*: stem procumbent; leaves inversely egg-shaped, smooth, entire; leaves alternate, on short petioles, stalked, thick, stiff, veiny, evergreen, wrink-

led, shining above, pale beneath, rounded, entire; flowers flesh-color-



ed or white, in short, drooping, terminal clusters; berry bright red, mealy, and harsh; flowers in May, June; height six inches; perennial; found on woody hills. The whole plant is astringent, and is employed in medicine. The berries, though harsh and insipid, are sometimes eaten.

**ARCTIUM.** 19—1.

*A. LAPPÆ*, *Common Burdock*: common calyx globular, permanent;



compound corolla of numerous, perfect, equal florets, with a long, slen-

der tube, and a wide egg-shaped limb, divided into five linear, regular, spreading segments; filaments hair-like, very short; anthers forming a cylindrical five-toothed tube, as long as the corolla; germen oblong, downy at the summit; style thread-shaped, longer than the stamens; stigmas reflected; seed inversely pyramidal, with four unequal, obtuse angles; seed-down simple, rough, shorter than the seed; receptacle flat; flowers in July, August; height about three feet; very common in waste and cultivated grounds.

This rank, coarse-looking plant is well known everywhere; its large, green, heart-shaped leaves, becoming gradually smaller toward the centre, form irregular, ill-looking, and worse smelling pyramids about every slovenly door-yard and garden. The burs sometimes take part in the sports of children, who naughtily stick them to one another's clothes and hair by means of the hooks with which they are covered. These hooked burs are a good example of one of the means which nature uses for the general dissemination of plants. Animals, as they stray among them, take a sample of the seeds, which stick to their coats,

which are thus conveyed away for spontaneous planting in some other place. Every dog's tail contrives to get ensnared and clotted with these tenacious pests, and so he unconsciously becomes an agent in the admirable provisions of nature for clothing the earth with verdure. The burdock, no doubt, has its uses; birds are fond of the seeds, and the roots help make a diet-drink, famous for curing the undefinable ills that ailing flesh is heir to.

ARE'CA. Cabbage-Tree. 21  
—8.

A. OLERA'CEA, *Esculent Cabbage-Tree*: fronds pinnated; leaflets linear, acute; fruit oblong, incurved.



The cabbage-tree is a palm, growing to the height of forty feet. The sheaths of the leaves are very close,

and form the green top of the trunk, a foot and a half in length. The inhabitants cut off this top, take out the white heart, of two or three inches diameter, consisting of the leaves closely folded together, and eat it, either raw with pepper and salt, or fried with butter. This palm is seven or eight feet in circumference near the ground, from whence it tapers gradually to the top, where the fine, plummy leaves form a most beautiful crown. This elegant tree is destroyed merely for the few mouthfuls of edible matter mentioned above, which resembles the almond in flavor, but more tender and juicy. The growth of a hundred years to furnish a single meal! Found on the coasts of the Carolinas, Georgia, and Florida. In the West Indies, it also occurs inland.

**ARENA'RIA.** Sandwort. 10  
—3. Calyx inferior, of five oblong, pointed, permanent leaves; petals five, egg-shaped or lance-shaped, undivided, withering; nectaries five or ten glands at the base of the stamens; filaments awl-shaped, five, rather shorter; anthers roundish; germen egg-shaped, superior; styles three, short, spreading; stigmas downy; capsule egg-shaped, covered by the calyx and corolla, one-celled,

three-valved; seeds numerous, kidney-shaped.

**A. RU'BRA,** *Common Sandwort*: leaves linear, bristle-pointed; stipules membranous, sheathing; seeds compressed, angular, roughish; stems numerous, prostrate, branched, hairy towards the extremity; leaves opposite; flowers from the forks of the stem; calyx clammy, ribless, longer than the pale purple petals; annual; flowers in June, July; height six inches; found in sandy fields and waste places.

**A. PEPLOIDES,** *Sea Chickweed*: leaves egg-shaped, acute, fleshy;



leaves of the calyx obtuse, ribless; root extensively creeping. The whole plant smooth and succulent, with inconspicuous white flowers; perennial; flowers in June and July; grows abundantly on the sea-coast in sandy and gravelly places;



a small plant, about three inches high.

There are several other species of *Arenaria*. The whole are rather perplexing to the young botanist, being difficult to distinguish. They are chiefly diminutive weeds, found almost exclusively on sandy soils.

#### ARISTOLOCHIA. 20—3.

*A. SERPENTARIA*, *Virginian Snake-root*: leaves alternate, heart-shaped,



cordate, oblong, acuminate; stem flexuous, ascending; peduncle radical; lip of corolla lanceolate; flowers of a dull purple; June, July; height twelve inches; perennial. This is a plant of some importance, its roots being used in medicine. They have an aromatic odor, and a warm, sharp, pleasant, bitter, pungent taste, and are stimulating and tonic. These roots are said to be

chewed by the Egyptian snake-jugglers, who stupefy the reptiles by introducing it into their mouths. It may be recognised by its singular flowers, which grow close to the ground. The corolla is a long curved tube, somewhat like the letter S, swelling at each end, expanding at the extremity into a broad margin, which forms an upper and under lip. Found in woods at the south, and, according to Bigelow, near New Haven, in Connecticut.

*ARTEMISIA*. Wormwood. 19—2. Common calyx roundish, imbricated, of rounded, close scales, membranous at the edges; compound corolla of two kinds of florets; those of the disk numerous, perfect, tubular, their limb with five segments; those of the ray few, destitute of stamens, generally without a petal, or awl-shaped, entire; filaments hair-like, very short; anthers united into a cylindrical tube; germen small, egg-shaped; style thread shaped, as long as the stamens; stigmas involute; seed inversely egg-shaped; seed-down none; receptacle nearly flat, naked or hairy.

*A. CANADENSIS*, *Wild Wormwood*; *Sea Wormwood*: leaves flat, linear, pinnatifid; branchlets terminating

in spikes of small flowers; flowers hemispheric; calyx scarious; receptacle smooth; stem decumbent, somewhat pubescent, woody; found on the sea-shore; flowers in August; perennial.

*A. CAMPESTRIS*, *Field Wormwood*: leaves divided into many linear segments; stems at first prostrate, after flowering erect; nearly two feet high; leaves smooth on the upper side, downy beneath; flowers drooping, small, yellow, in slender, terminal, leafy clusters; perennial; flowers brownish; August; height twelve inches; found on dry sandy soils in the southern and middle states.

*A. VULGARIS*, *Mugwort*: leaves pinnatifid, flat, cut, downy beneath; clusters simple; flowers egg-shaped; receptacle naked; stems from two to four feet high, erect, branched, paniced, smooth; leaves dark-green above, white and downy beneath; clusters erect, leafy; flowers purplish; slightly bitter and aromatic; perennial; flowers in July and August; height about three feet; found in waste places.

*A. ABROTANUM*, *Southern Wood*: stem upright; lower leaves bipinnate; upper pinnated, capillary; involucre downy, hemispherical;

flowers yellow and green; August to October; height three or four feet. This is a very common garden plant, sometimes known by the name of *Boy's Love*. It was once thought to possess great medicinal virtues, but, like many other simples, has outlived its reputation.

The genus contains many species, several of which have had their day as grand specifics for something or other. The common *wormwood*, *A. ABSINTHIUM*, is still in use as a tonic and antispasmodic. A class of the community are yet familiar with it as a *tonic* or *bitter*, as a phial of *essence o' wormwood* generally finds a place on the shelf with the *rum-bottle*, ready to impart its tone and flavor to the morning sling or *anti-fogmatic*.

*ARUM*. 21—7. Common calyx of one erect, sheathing, oblong leaf, convolute at the base, converging at the top, compressed in the middle, colored within, containing the flowers arranged upon a common stalk, the latter terminating in a colored, naked appendage; corolla none.

Barren flowers: filaments numerous, very short, arranged in several close rows round the stalk, within the convoluted part of the calyx, surmounted at a little distance

above by a ring of pointed, antherless filaments; anthers two-lobed.

Fertile flowers: germens sessile, inversely egg-shaped, in a dense ring round the lower part of the stalk, at a small distance below the barren flowers; styles none; stigma downy; berry globular, juicy, one-celled; seeds several, roundish.

*A. TRIPHYLLUM*, *Dragon Root*, *Wild Turnip*, *Indian Turnip*: stem-



less; leaves ternate, entire; spadix shorter than the spathe; spathe ovate acuminate, flat-stalked; height eight to twelve inches; flowers in May; perennial. This is a handsome and interesting plant, occasionally met with in rich shaded soils by fences. Though well worthy the attention of the young botanist, this plant is not one of the most agreeable. Examine it well, but though its root resembles a turnip, beware of tasting it, as we have no other vegetable so intensely acrid and

painful to the mouth as this. If it is but slightly chewed, the tongue and glands of the mouth become inflamed and swollen, leaving a soreness which lasts for several days.

*ARUNDO*. Reed. 3—2. Calyx of two unequal, lance-shaped, pointed, keeled, awnless chaff-scales; corolla of two unequal husks; the outer larger, lance-shaped, keeled, compressed, pointed; the inner cleft at the point, inflected at the edges; each husk with numerous, soft hairs at the base; nectary of two minute scales; filaments thread-like; anthers cleft at both ends; germen oblong; styles short; stigmas feathery; seed oblong, loose, but enveloped in the husks.

*A. PHRAGMITES*, *Common Reed*: flowers about five in each calyx,



awnless; panicle loose; root creeping; stems about six feet high,

stout, smooth; leaves lance-shaped, rough on the edges, many ribbed; panicle very large, with the branches in half whorls; flowers brownish purple, with large tufts of silky hairs; perennial; flowers in July; grows in ditches, marshes, lakes, and rivers; not very common, but often growing in large masses. In England it is used for thatching cottages.

*A. ARENARIA*, *Sea Reed*, *Mat-grass*, *Sea Bent*: calyx one-flowered, a little longer than the corolla; panicle close; leaves involute, pungent; root creeping, often twenty feet long; straw stiff, greenish yellow; leaves very long, mostly radical; panicle close, linear, attenuated at each end; chaff-scales unequal, membranous, rough on the keel. Very few of the seeds are perfected. This plant is common on the coasts, wherever there is loose sand, which it serves to bind down by its long tough roots. It is manufactured into door mats and floor brushes. In the Hebrides, it is made into ropes for various uses; mats for pack-saddles, bags and vessels for holding and preparing meal and grain, and into hats. Perennial; flowers in July.

*ASARUM*. *Asarabacca*. 11

—1. Calyx superior, of one leaf, bell-shaped, leathery, colored, permanent, in three or four deep segments; corolla none; filaments awl-shaped, half the length of the calyx; anthers adnate, of two round, separated cells; germen inferior, turbinate; style thick, furrowed, nearly as long as the stamens; stigma six-cleft, with recurved segments; capsule leathery, six-celled, not bursting; seeds several in each cell, inversely egg-shaped.

*A. CANADENSE*, *Wild Ginger*: leaves two, radical, broad, reniform; calyx woolly, deeply cleft, the segments broad, reflected; flowers from May to July; perennial; grows in rich shady places.

*A. VIRGINICUM*, *Sweet-scented Asarabacca*: leaves solitary, cordate,



obtuse, smooth; flower sub-sessile; calyx short, campanulate, smooth

outside; flowers in April; grows in light soils.

**ASCLEPIAS.** Swallow-Wort.  
5—2.

**A. TUBEROSA,** *Butterfly-weed*: stem erect, hairy, with spreading cymose branches at the end; leaves scattered, alternate, lanceolate, hairy; cymes terminal, erect; flowers numerous, of a bright orange color; calyx much smaller than corolla, 5-fid, segments subulate, reflexed, and concealed by corolla; seed-vessels erect, lanceolate; follicles downy, of a reddish-green color; seeds flat, roundish, ovate, margined, connected to the receptacle, by long shining, silky fibres; flowers from July to September; height two feet; perennial; found on hard dry soils.

**A. SYRIACA,** *Common Milkweed*: leaves lance-oblong, gradually acute, downy beneath; stem simple; umbels nodding; leaves opposite, large, oblong; flowers lateral and terminal; calyx segments lanceolate; corolla green and red, reflected; follicles oblong, acute, roughish, of a soft loose texture; seed roundish, flat, margined, attached to the receptacle by bundles of silky filaments, which are sometimes used as a substitute for feathers. Skilful and in-

dustrious young ladies have also made capes with this beautiful silk, which, for richness and elegance, leave the finest furs quite in the back-ground. Flowers in July and August; height four feet; very common by road-sides.

There are many species of *Asclepias*, all of which, I believe, are indigenous in the American continent. Some of them are well known to every one. The curious and singular pods or follicles attract the attention of the school-boy, who, on opening them, finds a beautiful imbricated mass of seeds and silk, corresponding to the size and shape of the follicle. In the middle of this is the receptacle, a lance-shaped kind of leaf, beautifully furrowed and dotted or pearly with the points to which the seeds were attached by their flossy down. Sometimes he forms mimic cattle by inserting four slender sticks in the pods for legs. When the stem or leaves of the common milkweed are broken, a thick, milky juice exudes, of an acrid quality, which has the credit of efficacy in removing warts by frequent application. The young plants are also boiled and eaten like asparagus, from which it cannot be distinguished by the taste. Among

the other species is *A. PHYTOLAC-CORDES*, *Poke-leaved Milkweed*, a rather taller and more slender plant than *A. SYRIA'CA*; it may be distinguished by its pods, which are smooth, long, slender, and of a strong green color; it is found in low grounds.

**ASPARAGUS.** 6—1. Calyx none; corolla inferior, divided into six equal, oblong segments, permanent; filaments thread-shaped, short; anthers oblong, erect; germen globular; style very short; stigma three-lobed; berry globular, three-celled; seeds one or two in each cell.

*A. OFFICINA'LIS*, *Common Asparagus*: a well-known culinary vegetable, not indigenous in this country, but naturalized and met with in almost every garden. It is one of the oldest and most delicate of culinary vegetables. In Europe, it grows wild on the sea-shores, and is very abundant on the sandy plains of Russia, Turkey, and Greece.

**ASTER.** Starwort. 19—2. Common calyx oblong, imbricated; the inner scales standing out at the points, the lowermost spreading; compound corolla rayed; florets of the disk numerous, perfect, tubular, with five equal, spreading segments; those of the ray more than ten,

strap-shaped, oblong, three-toothed, finally revolute, without stamens; filaments hair-like, short; anthers united into a cylindrical tube; germen oblong; style thread-shaped; stigmas two, oblong, spreading, those of the disk larger; seed inversely egg-shaped; down sessile, hair-like; receptacle naked, almost flat.

*A. NOVA-AN'GLIÆ*, *New England Aster*: leaves linear-lanceolate,



clasping the stem, auricled at base; stem simple, pilose, straight, heads sessile, terminal, clustered; calyx scales longer than the disk; flowers larger; rays deep purple; September, October; height four or five feet; found by road-sides; perennial. This beautiful plant has been introduced into European gardens, where it is much prized.

*A. SALICIFOLIUS*, *Willow-leaved*

*Aster* : leaves sessile, linear-lanceolate, entire, smooth; stem smooth, paniced at the end; involucre lanceolate, imbricated; scales acute, spreading at the ends; flowers bluish pink; September to October; height six feet; found in woods; perennial. This is a tall, slender plant, with a somewhat flexuous stem, and smooth, slender, alternate branches.

The species of this genus are very numerous, particularly in America. They are readily distinguished from other plants, but not so easily from each other.

**A<sup>T</sup>RIPLEX.** Orache. 23—1. Perfect flowers: calyx inferior, permanent, deeply divided into five equal, egg-shaped, concave segments, membranous at the edges; corolla none; filaments five, awl-shaped, as long as the calyx; anthers round, two-lobed; germen superior, round, often imperfect; style short, deeply divided; stigmas simple, spreading; seed one, round, depressed, invested by a thin pellicle, and covered by the closed, permanent, five-cornered calyx.

Pistilliferous flowers: calyx inferior, deeply divided into two large, flat, egg-shaped segments; corolla none; stamens none; germen su-

perior, compressed; style short, deeply divided; stigmas spreading; seed one, round, compressed, invested by a thin pellicle, and enclosed between the enlarged, heart-shaped leaves of the calyx.

**A. PA<sup>T</sup>ULA,** *Spreading Halbert-shaped Orache* : stem herbaceous,



spreading; leaves between lance-shaped and triangular, somewhat halbert-shaped; calyx of the fruit tuberculated at the sides; stem and leaves dull green, slightly mealy, often reddish; annual; flowers in June and July; grows in salt marshes.

**A. LACINIA<sup>T</sup>A,** *Frosted Sea Orache* : stem herbaceous, spreading; leaves between triangular and egg-shaped, widely toothed, mealy beneath; stems about a foot high,

mealy, alternately branched; leaves alternate, stalked, entire at the base; perfect flowers in terminal, lobed clusters, their germens commonly about five; fertile flowers axillar, several together; annual; flowers in July; grows in sand, on the sea-coast.

*A. ANGUSTIFOLIA*, *Spreading Narrow-leaved Orache*: stem herbaceous; leaves lance-shaped, entire, the lower ones three-lobed; calyx of the fruit halbert-shaped, slightly tuberculated at the sides; resembles the former, of which it is perhaps only a variety; annual; flowers in July; grows in cultivated and waste ground.

*AZALEA*. 5—1. Calyx inferior, of one leaf, deeply divided into five acute, erect segments, permanent; corolla of one petal, bell-shaped, divided half-way into five nearly equal segments with inflected margins; filaments thread-shaped; anthers roundish; germen globular; style cylindrical, erect, permanent; stigma knobbed; capsule roundish, with five deep furrows, five-celled, five-valved; seeds numerous, roundish.

*A. PROCUMBENS*, *Trailing Azalea*: branches spreading and procumbent; leaves opposite, revolute, smooth.

A small shrub growing in tufts; flowers terminal, rose-colored; flowers in July; found on the summits of the White mountains.

*A. VIBICOIDES*, *Wild Honey-suckle*; *Swamp Pink*: branches hispid;



leaves with a rough margin, same color on both sides, the nerve hispid; corolla viscid, hairy; stamens little longer than corolla; flowers white; June, July. This beautiful little shrub is found abundant in our swamps, where its delightful fragrance is perceived at a considerable distance. There are varieties of this species, with striped and pink colored flowers.

## B.

*BALLOTA*. Horehound. 14—1. Calyx of one leaf, tubular, ob-



long, with five corners, ten ribs, and ten furrows, the limb dilated, spreading, plaited, regular, with five pointed teeth; corolla gaping; tube cylindrical, as long as the calyx; upper lip erect, egg-shaped, notched; lower lip three-lobed, the middle lobe larger and cleft; filaments awl-shaped, directed towards the upper lip; anthers oblong, two-valved; germen small, four-lobed; style thread-shaped, as long as the stamens; stigma slender, cleft; seeds four, egg-shaped, in the bottom of the somewhat hardened calyx.

B. NIGRA, *Black Horehound*: leaves egg-shaped, undivided, ser-



rate; calyx funnel-shaped, abrupt, with short spreading teeth; stem two or three feet high, erect, branched, downy; calyx dilated at the mouth; corolla dull purple; upper lip cleft, covered externally with white hairs lower marked with white veins; perennial; flowers

in July and August; grows with other weeds about slovenly buildings.

BERBERIS. 6—1. Calyx inferior, of six, inversely egg-shaped, spreading, colored leaves, the three outer smaller; petals six, roundish, spreading, the claw of each having two oblong nectariferous glands; filaments linear, flattened; anthers of two separate lobes, on the opposite edges of the top of the filament; germen superior, oblong; stigma round, broader than the germen, permanent; berry oblong, one-celled, pulpy; seeds two or three, oblong, cylindrical.

B. VULGARIS, *Common Barberry*: clusters pendulous; thorns three-



cleft; leaves inversely egg-shaped with bristly serratures; a bushy shrub, three or four feet high; flowers bright yellow; the stamens, on being irritated, contract, and thus

throw the pollen upon the stigma ; berries scarlet, very acid, when boiled with sugar forming a very agreeable jelly. This plant is said to be injurious to grain growing in its neighborhood, causing blight ; this however is disputed.

**BETULA.** Birch. 21—4. Barren flowers : catkin cylindrical, loose, imbricated all round, with ternate, concave scales, the middle one largest, egg-shaped ; corolla none ; filaments from ten to twelve, shorter than the scale ; anthers roundish, two-lobed.

Fertile flowers : catkin cylindrical, dense ; scales peltate, dilated outwards, three-lobed, three-flowered ; corolla none ; germen compressed, bordered, two-celled ; styles two, awl-shaped, downy ; stigmas simple ; nut oblong, deciduous, winged, one-celled ; kernel solitary.

**B. Papyra'cea,** *Canoe Birch, Paper Birch* : leaves ovate, acuminate, doubly serrate ; the veins hairy beneath. This birch is very abundant in the northern and eastern part of the United States, Lower Canada, and New Brunswick. It attains its largest size, which is about seventy feet in height and three feet in diameter, on the declivity of hills, and in the bottom

of fertile valleys. Its branches are flexile, slender, and covered with a shining, dark-brown bark, dotted with white. The leaves are of a dark-green color, smooth, oval, terminating in a rather slender point. The aments are pendulous and about an inch in length. The seeds are ripe toward the middle of July. The wood is handsome, with some strength, but as it decays speedily it is not used as timber ; tables are sometimes made of it, and stained in imitation of mahogany. It is good fuel. The Indians make their canoes of the bark of this tree, which they peel off in large plates and sew with fibres of the roots of the White Spruce. These canoes are so light that one calculated for four persons with their baggage weighs only forty or fifty pounds, so that they are easily carried on the shoulders of two men from one river to another. Little baskets for *huckle-berrying*, and other light purposes, are also made of this bark, and as it may be divided into thin delicate sheets like paper, I suppose the Indians may have sometimes written their *love letters* on it.

**B. Populifolia,** *Common, White Birch* : leaves acuminate, serrate, smooth ; scales of the cones with

lateral lobes, roundish ; petioles smooth. This birch, common in



the north-east part of the United States, is found, but more rarely, as far south as Virginia. It occurs most frequently on dry meagre soils, where it attains a height of twenty or twenty-five feet. No use is made of the wood.

**B. RUBRA, Red Birch :** leaves acuminate, doubly toothed, light green above, whitish beneath ; petioles short, hairy ; aments about half an inch long, straight, and nearly cylindrical ; seeds ripe early in June. This birch is common in the middle and southern states, and is generally found on the banks of rivers. It grows to the height of seventy feet, with a diameter of two or three feet. Bowls and trays are sometimes made of the wood. The twigs

make good brooms for out-door use, and are used as a corrective in the in-door economy of school and family government.

**B. LENTA, Black Birch, Mahogany Birch :** leaves heart-ovate, acutely



serrate, acuminate, glabrous. This birch abounds in the middle states, and is not uncommon in the northern and eastern. South of Pennsylvania it is confined to the summits of the Alleghanies. It is a handsome tree, sometimes reaching, in favorable situations, the height of seventy feet, with a diameter of three feet. The wood is strong, of a reddish color, and when old and well seasoned, resembles mahogany ; it is used in the manufacture of tables, bedsteads, chairs, &c. The leaves are fragrant, and the

bark of the young shoots has a pleasant aromatic taste.

**BIDENS.** *Bur-Marygold.* 12—  
1. Common calyx erect, of several oblong, nearly equal, parallel scales, concave or channelled on the back; compound corolla level at the top, of several parallel, perfect, tubular, equal florets; their limb egg-shaped, with five marginal, spreading segments; filaments hair-like, very short; anthers united into a cylindrical tube; germen oblong, compressed, with bristly, erect points on its outside; style thread-shaped, as long as the stamens; stigmas long, reflected; seed angular, abrupt, beaked with two or more bristles, which are rough with deflected prickles; receptacle flat, covered with erect, chaffy, oblong, deciduous scales.

**B. CER'NUA,** *Nodding Bur-marygold:* leaves lance-shaped, serrate; flowers drooping; bracteas lance-shaped, nearly equal; bristles of the seed about four, erect; stem erect, two or three feet high; flowers large, yellow; annual; flowers in September; grows by the sides of ditches and ponds.

**B. CHRYSANTHEMOIDES,** *Large-flowered Bidens:* flowers erect, radiate, three times as long as calyx; leaves lanceolate, serrate, connate

at the base; stem one to three feet high; flowers large; the rays eight spreading, yellow; August to October; annual; grows in wet places.

**B. TRIPARTITA,** *Three-cleft Bur-marygold:* leaves divided into three segments; bracteas lance-shaped, unequal; bristles of the seeds two or three, erect; stem two or three feet high; flowers brownish yellow; August and September; annual; grows about the sides of ditches and ponds.

**BIGNONIA.** *Trumpet-Flower.* 14—2.

**B. RADICANS,** *Trumpet-Flower:* leaves pinnate; leaflets ovate, acuminate, toothed; corymb terminal; tube of corolla three times as long as calyx. This is a most beautiful climbing shrub, reaching the height of thirty feet, and producing a profusion of orange-colored flowers from June to August. One variety of this species produces flowers of a scarlet-yellow, and another, bright scarlet. They are indigenous in the middle part of the United States, and have been introduced into European gardens, where they are greatly admired.

**BRASSICA.** 15. Calyx of four oblong, concave leaves, protuberant and close below; spreading

above; petals inversely egg-shaped, spreading, with erect, channelled claws; filaments awl-shaped, erect; a gland at the inside of each of the outer, and one at the outside of each of the longer pairs; anthers oblong; germen cylindrical, as long as the stamens; style tapering; stigma knobbed; pod nearly cylindrical, beaked, with the style two-celled, with a cell in the beak; valves concave; partitions membranous; seeds nearly globular, arranged in a single row; the cell of the beak also sometimes containing one or more seeds.

**B. NATUS**, *Rape, Cole-seed*: root spindle-shaped; leaves smooth, upper ones lance-shaped, heart-shaped at the base, and clasping; the lower ones lyre-shaped, toothed; stem erect, striated, branched, two feet high; leaves glaucous; flowers bright yellow.

**B. RA'PA**, *Common Turnip*: root fleshy, globular, depressed; root-leaves lyrate, rough; stem-leaves nearly entire, smooth; flowers pale yellow; biennial; flowers in May.

**B. OLERA'CEA**, *Sea Kale, or Cabbage*: root stem-like, cylindrical, fleshy; leaves glaucous, waved, lobed, smooth; from one to two feet high; flowers pale yellow, large; biennial; flowers in May

and June; grows on maritime cliffs. From this species are derived all our numerous varieties of cabbage.

This genus comprises all the species and varieties of the cabbage, turnip, and borecole, so well known in agriculture. They are all exotic.

**BROMELIA**, *Pine-Apple*. 6—1.

**B. ANA'NAS**, *Common Pine-Apple*: leaves fringed with spines, mucronate; spike comose. The pine, so well known here by its delicious fruit, is a native of South America, but is generally cultivated in nursery gardens throughout the country. When in fruit, the plant has a fine rich appearance.

## C.

**CACTUS**. 12—1.

**C. OPUN'TIA**, *Prickly Pear*: peoli-



ferous; articulations compressed,

ovate; bristles fascicular. This plant, like many others of the genus, has the appearance of a series of thick fleshy leaves, one growing from the top or on the sides of the other. It is very common on the rocky mountains near New Haven.

This genus consists of thick, succulent plants, of very singular and various structure; generally without leaves, and having the stem or branches jointed; for the most part armed with spines in bundles, with which, in many species, bristles are intermixed. There are many species, all natives of this continent. The flowers of many are very beautiful. *C. grandiflorus* produces flowers of an exquisite fragrance, near a foot in diameter; the inside of a splendid yellow color, the outside dark brown, the stamens pure white. *C. flagelliformis* also produces very sweet flowers. Some are valued for their fruit; some are inhabited by the famous cochineal insect, and all are remarkable for their singular appearance.

**CALLITRICHE.** Water Starwort. 1—2. Calyx none; petals two, curved inwards, opposite, equal; filament slender, elongated; anther two-lobed; germen superior,

four-lobed; styles two, hair-like; stigmas acute; seeds four, oblong.

*C. AQUATICA*, Water Starwort: leaves lance-shaped, the upper ellip-



tical, entire at the end; stems floating, feeble, numerous, branched, leafy; lower leaves in pairs, lance-shaped; upper crowded in the form of a star, elliptical or inversely egg-shaped and floating; flowers axillar, solitary, sessile, very small; some imperfect flowers mixed with the others; annual; flowers in April, May and June; grows by the edges of pools, ditches, and especially brooks; common.

**CAL'THA.** Marsh-Marigold. 13—4. Calyx none; petals five or more, inferior, egg-shaped, spreading; nectaries none; filaments numerous, thread-shaped, shorter than the petals; anthers oblong, two-lobed, erect; germens superior, from five to ten, oblong, compressed, erect; styles none; stigmas obtuse;

follicles cylindrical, pointed, two-edged; seeds numerous, oval, arranged along the edges of the follicle.

*C. PALUSTRIS*, *Common Cow-slip*: stem erect; leaves heart-



shaped, rounded; root large; stem about-a foot high, hollow, round, branched; lower leaves stalked, upper sessile; petals five, roundish, bright yellow; perennial; flowers May and June; grows in wet meadows and by the sides of brooks. The young tender leaves and flower-buds of this plant are much used as *greens*. With their large, shining, dark green leaves, and bright flowers, the plants make a handsome appearance, and are quite an ornament to our meadows, at a time that the other vegetation has scarcely begun to feel the effects of returning spring.

*CAMELIA*. 16—7.

*C. JAPONICA*, *Japan Rose*: leaves ovate, acuminate, acutely serrate;

flowers terminal, solitary. In this country, this camellia is only found as a small beautiful greenhouse and parlor shrub, but in Japan, its native country, it grows to the size of a large, lofty tree, much admired for its rich, shining, dark green foliage and elegant flowers; these are generally about the size of common roses, and are of many sorts and colors. With us, the *Double White*, *Double Red*, and *Double Striped*, all garden varieties of the same species, are successfully cultivated and much admired.

The tea-shrubs of China belong to this genus, the green tea being produced from *C. viridis*, and the black from *C. bohea*.

*CAMPANULA*. Bell-flower. 5—1. Calyx superior, of one leaf, deeply divided into five acute segments, permanent; corolla of one petal, bell-shaped, impervious at the base, furnished at the lower part with five acute valves, covering the top of the germen, the limb divided into five broad, regular segments; filaments hair-shaped, very short, from the point of the valves; anthers linear, compressed; germen inferior, angular; style thread-shaped, longer than the stamens; stigma oblong, with three revolute divi-

sions; capsule roundish, angular, three-celled; seeds numerous, small.

**C. ROTUNDIFOLIA**, *Round-leaved* or *Common Bell-flower*: root-leaves kidney-shaped, serrate; stem-leaves linear, entire; the root-leaves wither very soon, so that when the plant is in flower the stem-leaves alone are to be seen; stem about a foot high; corolla blue; perennial; flowers in July and August; grows in dry pastures, by road-sides, hedges, &c.; common.

**C. PERFOLLIATA**, *Clasping Bell-flower*: stem simple, erect, somewhat hairy; leaves small, attenuate, heart-shaped, toothed, clasping the stem; flowers axillary, sessile, clustered; corolla spreading; flowers blue; June; annual; found by road-sides on dry soils.

**CANNA**. Indian Shot. 1—1.

**C. FLACCIDA**: spike terminal; flowers few; bractea an obtuse scale surrounding the base of the germ; calyx three-leaved; corolla one-petalled; root perennial, creeping; stem herbaceous, two to three feet high, very smooth; flowers yellow; May to July; grows in wet places on the borders of ponds in Georgia.

**CARDAMINE**. 15. Calyx of four oblong, blunt, slightly spread-

ing leaves, two of them protuberant at the base; petals inversely egg-shaped, undivided, tapering into short claws; filaments awl-shaped, the two shorter with a gland at the base; anthers small, heart-shaped, acute, recurved; germens linear, slender; style very short; stigma obtuse; pod erect, linear, compressed; valves flat, without ribs, scarcely narrower than the bordered partition; seeds egg-shaped, not bordered, inserted alternately in a single row, by short and slender stalks.

**C. HIRSYTA**, *Hairy Cardamine*: leaves pinnate, without stipules;



leaflets stalked, roundish; from three inches to a foot high, more or less hairy; flowers small, white, corymbose; annual; flowers from May to July; grows in loose soil, in shady places.

**C. PENSYLVANICA**, *Common Water Cress*: leaves pinnatifid or lyrate; lobes angular, toothed, blunt; stem



erect; petals oblong, linear; flowers white; May; height of stem twelve inches. This is a very common plant throughout the northern and middle states, in brooks, growing under water, except its flowers and a few of the upper leaves. The upper leaf is always the largest.

C. PRATEN'SIS, *Ladies' Smock, Cuckoo-flower*: leaves pinnate, without stipules; leaflets of the radical ones roundish, toothed; those of the stem-leaves lance-shaped, entire; petals with a tooth on the claw; about a foot high; flowers large, in corymbs, pale purple, lilac or white; perennial; grows in moist meadows and watery places; flowers in May.

CAREX. 21—3. Barren flowers numerous, arranged in one or more oblong, dense catkins, with scales imbricated all round; calyx a lance-shaped, permanent chaff-scale; corolla none; filaments three, hair-like, longer than the scales; anthers linear, two-celled. Fertile flowers numerous, arranged in one or more oblong, dense catkins; calyx a lance-shaped chaff-scale; corolla a compressed, ribbed, permanent husk; germen superior, roundish, three-cornered, smooth; style one, terminal, cylindrical, short; stigmas three, awl-shaped, long, downy, deciduous;

seed roundish, three-cornered, loosely covered by the enlarged husk.

*Catkins solitary, simple.*

C. DIOR'CA, *Creeping diœcious Carex*: catkins simple, diœcious; fruit egg-shaped, ascending, pointed, striated, rough at the edges; root creeping; four or five inches high; leaves keeled; scales of the catkins brown, with a green rib and white edges; perennial; flowers in May and June; grows in boggy places; not uncommon.

C. DAVALLIA'NA, *Prickly diœcious Carex*: catkins simple, diœcious; fruit lance-shaped, deflexed, beaked, ribbed, rough-edged near the top; root tufted; five or six inches high; perennial; flowers in May and June; grows in marshy places; rare.

*Catkins or spikelets aggregate, each composed of barren flowers and fertile flowers; stigmas two.*

C. CUR'TA, *White Carex*: spikelets about six, elliptical, somewhat distant; scales egg-shaped, membranous, small; fruit broadly egg-shaped, tumid, smooth; straw a foot high, three-cornered, rough at the upper part; spikelets silvery; perennial; flowers in June; grows in watery places; not common.

C. STELLULA'TA, *Little Prickly Ca-*

*rez*: spikelets three or four, roundish, rather distant; barren flowers



inferior; fruit spreading, egg-shaped, with a flat beak, rough at the edges; straw about eight inches high, triangular, with roughish edges; fruit brown; perennial; flowers in May and June; grows in boggy meadows; common.

*C. OVALIS*, *Oval-spiked Carex*: spikelets about six, oval, close together; barren flowers inferior; fruit lance-shaped, rough-edged, striated, as long as the lance-shaped scales; straw from twelve to eighteen inches high, with rough corners; spikelets grayish, each with a large egg-shaped scale at the base, the lowest with a bristle-shaped bractea; perennial; flowers in June; grows in marshy places and wet meadows.

*C. REMOTA*, *Remote Carex*: spikelets several, nearly sessile, distant

from each other; barren flowers inferior; bracteas very long; fruit egg-shaped, obtuse at the edges, the beak slightly cleft; straw about a foot high, three-cornered above, with rough edges; spikelets yellowish; perennial; flowers in May and June; grows in moist shady places.

*C. MURICATA*, *Greater Prickly Carex*: spike oblong, dense, compound; spikelets with the fertile flowers inferior; fruit spreading, egg-shaped, acutely angular, with a long, rough-edged, cleft beak; root fibrous; straws a foot and a half high; perennial; flowers in May and June; grows in marshes and shady places.

*C. TERETIUSCULA*, *Lesser Clustered Carex*: spike dense, twice or thrice compounded; spikelets egg-shaped, sterile at their extremity; fruit spreading, tumid at one side, with a tapering serrate beak; straw three-cornered, with convex sides; straws twelve or eighteen inches high; perennial; flowers in May; grows in wet meadows.

*C. PANICULATA*: spike thrice compound, loosely panicked, interrupted, acute; spikelets egg-shaped, sterile at their extremity; fruit spreading, with an abrupt serrate beak; straw acutely three-cornered,

with flat sides; stem two or three feet high; perennial; flowers in June; grows in wet meadows and marshy places.

*Barren flowers and fertile flowers in separate catkins; the barren catkin solitary; bractes leafy; stigmas three.*

**C. CAPILLARIS, Dwarf Hair-like Carex:** common sheath much shorter than the drooping, hair-like flower-stalks; fertile catkins egg-shaped, rather loose, pendulous; fruit egg-shaped, three-cornered, pointed, ribless, membranous at the tip; root fibrous; from two to four inches high; perennial; flowers in July and August.

**C. PSEUDOCYPERUS, Cyperus-like Carex:** sheaths scarcely any; fertile catkins dense, cylindrical, drooping, many-flowered; scales awl-shaped; fruit lance-shaped, spreading, furrowed, rough-edged, with a deeply cleft beak; straw about a foot high, with three sharp, rough corners; perennial; flowers in June; grows in clusters on marshy places, and by rivers and lakes.

**C. LIMO'SA, Green and gold Carex:** sheaths scarcely any; fertile catkins egg-shaped, dense, drooping, many-flowered; fruit broadly elliptical, compressed, ribbed, smooth-edged, without a beak; root creeping; straws

about eight inches high, three-cornered, roughish; perennial; flowers in July; grows in bogs and marshes.

**C. USTULATA, Scorched Alpine Carex:** sheaths very short; fertile catkins egg-shaped, dense, pendulous; fruit elliptical, compressed, rough-edged, with a cleft beak; root tufted, somewhat creeping; straw three or four inches high; perennial; flowers in July.

**C. PALLESCENS, Pale Carex:** sheaths scarcely any; fertile cat-



kins cylindrical, stalked, somewhat drooping; fruit inversely egg-shaped, three-cornered, inflated, smooth, with a minute abrupt point; straws a foot or more high, acutely three-cornered; catkins pale green; perennial; flowers in June; grows in wet meadows and marshy places.

**C. ATRA'TA, Black Carex:** sheaths

scarcely any; catkins stalked, egg-shaped, drooping, the terminal one with many barren flowers at the base; fruit elliptical, compressed, smooth, with a notched beak; straw about a foot high, three-cornered, smooth; catkins reddish black; perennial; flowers in June and July; grows on woody hills and mountains.

*C. FLAVA*, *Yellow Carex*: sheaths short, nearly as long as the flower-stalks; fertile catkins roundish, egg-shaped; fruit three-cornered, smooth, with a long curved beak, notched at the end; stem about a foot high, nearly smooth; catkins yellowish; perennial; flowers in May and June.

*Barren flowers and fertile flowers in separate catkins; barren catkins two or more.*

*C. ACUTA*, *Slender-spiked Carex*:



stigmas two; sheaths none; catkins

cylindrical, slender; fruit elliptical, with an obtuse, undivided point; straws two or three feet high, with rough angles; leaves broad, rough on the edges and keel; perennial; flowers in May; grows about ditches, pools, and rivers; common.

*C. FRASERIANA*, *Fraser's Carex*: leaves oblong, lanceolate, with a white scarios margin; heads oblong; scape not longer than the leaves; flowers in May, June; height six inches. This is the handsomest species of the genus.

The species of carex are very numerous, and grow mostly in meadows, marshes, and other wet places. They are a coarse sort of grass, of little use as fodder, and generally destitute of beauty. In Lapland, some are dressed and used as flax. In Italy, they are used for covering Florence flasks, and for chair-bottoms.

**CARPINUS.** Hornbeam. 21—

7. Barren flowers: catkin cylindrical, loose, imbricated all round, with egg-shaped, acute, fringed, single-flowered scales, accompanied by three smaller inner ones; corolla none; filaments ten or more, hair-like, much shorter than the scale; anthers roundish, two-lobed. Fertile flowers in a bracteated cluster;

calyx double; the outer inferior, of several oblong, unequal, erect, deciduous, two or three-flowered scales; the inner superior, deeply divided into three erect, acute, permanent segments; corolla none; germen egg-shaped, crowned by the inner calyx; styles very short, permanent; stigmas two, awl-shaped, erect, deciduous; nut egg-shaped, angular, leathery, one-celled, crowned by the inner calyx and the base of the style; kernel one.

**C. AMERICA'NA**, *Hornbeam*: leaves oblong-ovate, acuminate, finely den-



ticated; scales of cones three-parted, the middle segment oblique, ovate, lanceolate, one-toothed on one side; flowers in April and May; height twelve or fifteen feet. A small tree, common in the woods

of all parts of the United States. The wood is white, very compact, and fine-grained, but too small for any use. From the ends of the branches hang long, loose, leafy aments, each leaf of which is furnished at the base with a dark, brownish seed, or nut. These aments remain on the tree long after the foliage is shed. The *Gum Tree* or *Tupelo* is also called Hornbeam in New England.

**CASTA'NEA**. 21—7.

**C. VES'CA**, *Common Chesnut*: leaves oblong, lanceolate, acuminate, mu-



cronate, serrate, glabrous on each side. With us, the chesnut is one of our finest trees, but they are quite eclipsed by some said to be found in the eastern continent, measuring from seventy-five to one hun-

dred and sixty feet in circumference. One in France, thought to be more than a thousand years old, has been known as the *Great Chesnut* for six hundred years; its branches are still annually laden with fruit, and the trunk is perfectly sound. In this country, it generally attains the height of fifty or sixty feet, the trunk quite large in proportion. Its leaves are six or seven inches long, an inch and a half in breadth, coarsely toothed, of a fine brilliant green color, of fine texture, with prominent parallel nerves beneath. The wood is coarse-grained, but strong, elastic, and light; it is very durable, and is much used for fences, which endure the alternate moisture and dryness of the weather many years. But what recommends this tree particularly to the young folks, is its fruit; almost every boy must have his winter stock of *chesnuts* and *shagbarks*, to enjoy with his friends during the long evenings.

C. FUMILA, *Dwarf Chesnut*, *Chinquapin*: leaves oblong, acute, mucronate, serrate, white, with down beneath. The chinquapin is bounded northward by the eastern shore of the river Delaware, on which it is found to the distance of a hundred miles from Cape May. It is more

common in Maryland, and still more so in the lower part of Virginia, of the Carolinas, Georgia, the Floridas and Louisiana, as far as the river Arkansas. In West Tennessee, it is multiplied around the prairies inclosed in the forests, and it abounds throughout the southern states where the chesnut is wanting. In the south of the United States, the chinquapin fructifies on the most arid lands: its perfect development requires a cool and fertile soil. As it springs everywhere with facility, except in places liable to be covered with water, it is among the most common shrubs.

This tree sometimes grows to the height of thirty or forty feet and twelve or fifteen inches in diameter, although its usual height is ten or twelve feet. The leaves are three or four inches long, sharply toothed, and similar in form to those of the American chesnut, from which they are distinguished by their inferior size, and by the whitish complexion of their lower surface. The fructification, also, resembles that of the chesnut in form and arrangement, but the flowers and fruit are only half as large, and the nut is convex on both sides, and about the size of the wild hazel nut.

## CATALPA. 2—1.

*C. SYRINGIFOLIA*, *Common Catalpa*: leaves cordate, flat, smooth.



In the Atlantic states, the catalpa begins to be found in the forests, on the banks of the river Savannah, and west of the Alleghanies, on those of the Cumberland, between the thirty-fifth and thirty-sixth degrees of latitude. Farther south it is more common, and abounds near the borders of all the rivers which empty into the Mississippi, or which water West Florida. In the regions where it grows most abundantly it frequently exceeds fifty feet in height, with a diameter from eighteen to twenty-four inches. It is easily recognised by its bark, which is of a silver-gray color, and but slightly furrowed, by its ample leaves, and by its wide-spreading

summit, disproportioned in size to the diameter of its trunk. It differs from other trees also by the fewness of its branches. The flowers, which are collected in large bunches at the extremity of the branches, are white, with violet and yellow spots, and are beautiful and showy. The capsules are cylindrical and pendent, of a brown color when ripe, three or four lines in diameter and twelve or fifteen inches in length. The seeds are thin, flat, and developed in a long, narrow, membranous wing terminated by a hairy tuft. Each seed, with its wing, is about an inch long, and a line and a half broad.

That the catalpa is a tree of rapid growth is proved by the distance of the annual concentric circles. Its wood is of a grayish-white color, of a fine texture, very light, and very brilliant when polished. It resembles the butternut wood, with this exception, that the butternut wood is of a reddish hue, and is less durable when exposed to the weather. Posts of the catalpa perfectly seasoned have been proved to be very durable. In the spring, if a bit of the cellular integument of the catalpa bark is removed, a venomous and offensive odor is exhaled. In a thesis supported at the medical

college of Philadelphia, this bark is maintained to be tonic, stimulant, and more powerfully antiseptic than the Peruvian bark. It is stated that the honey collected from the flowers of this tree is poisonous, and that its effects, though less alarming, are analogous to those of honey of the yellow jasmine. Its bark is considered to be a good antidote for the bite of snakes, the machineel poison, &c.

**CEANOTHUS. 5—1.**

*C. AMERICA'NA, Jersey Tea* : leaves heart-ovate, acuminate, three-nerv-



ed beneath, soft, with hairs; panicles axillary, elongated; flowers white; June; height two feet; grows in dry or sandy places. This little shrub may be known by its crowded bunches of white, minute flowers, which grow on long, slender, white pedicels from the axils of the upper leaves. During the war of the revolution, its leaves

were used as a substitute for tea, whence the name. The root is sometimes used for dying wool of a nankeen cinnamon color.

**CELTIS. Nettle Tree. 23—1.**

*C. OCCIDENTA' LIS, American Nettle Tree* : leaves ovate, acuminate,



acuminate serrated, unequal at base, rough above and hairy beneath. This tree abounds in the middle, southern and western states. It grows to the height of sixty or seventy feet, with a diameter of eighteen or twenty inches. Its branches are numerous and slender, and the limbs take their rise at a small distance from the ground, and seek a horizontal or an inclined direction. The bark is rough and entire upon the trunk, and smooth and even on the secondary branches. The leaves



are alternate, about three inches long, of a dark green color, oval-oblique at the base, very acuminate at the summit, denticulated, and somewhat rough. The flowers open in April or May, and are small, white, single and axillary; the fruit also is small and single, of a round form, and of a dull red color. When perfectly seasoned, the wood is of a dark brown color, hard, compact, supple and tenacious: it makes excellent hoops and whip-stocks, and is used by wheelwrights for shafts and for other purposes.

C. CRASSIFOLIA, *Hackberry, Hoop Ash*: leaves ovate, acuminate, serrated, unequally cordate at base, sub-coriaceous, rough on both sides. This tree abounds in the western states. It attains a height of seventy or eighty feet, with a disproportionate diameter of eighteen or twenty inches. In rich soils the luxuriance of its vegetation is shown by sprouts, six or ten feet in length, garnished on each side with large, substantial leaves. The hackberry is easily distinguished by the form of its trunk, which is straight and undivided to a great height, and by its bark, which is grayish, unbroken, and covered with asperities unequally distributed over its surface. Its

leaves are larger than those of any other species of nettle tree, being six inches long and three or four broad. They are oval-acuminate, denticulated, cordiform at the base, of a thick, substantial texture and of a rude surface. It puts forth flowers in May, which are small, white, and often united in pairs on a common peduncle. The fruit is round, about as large as a pea, and black at its maturity. The wood is fine-grained and compact, but not heavy, and when freshly exposed it is perfectly white: sawn in a direction parallel or oblique to its concentric circles, it exhibits the fine undulations that are observed in the elm and locust. On laying open the sap of this tree in the spring, it changes in a few minutes from pure white to green. This wood is little appreciated, on account of its weakness, and its speedy decay when exposed to the weather. It is rejected by wheelwrights, but is sometimes employed in building for the covering which supports the shingles. As it is elastic and easily divided, it is used for the bottom of common chairs, and by the Indians for baskets. On the banks of the Ohio it is frequently taken for the rails of rural fence, and is wrought with the

greatest ease, as it is straight-grained and free from knots; it is also said to afford excellent charcoal.

**CENTAUREA.** 19—3. Common calyx roundish, closely imbricated, with scales of various forms; compound corolla of numerous tubular florets, those of the disk perfect, regular, with five equal spreading segments, an oblong limb, and a slender tube; those of the ray fewer, with a rudimentary pistil, not perfecting seed, spreading, often wanting, funnel-shaped, with five or more unequal segments; filaments hair-like, very short; anthers united into a cylindrical tube; germens small, oblong; style thread-shaped, about the length of the stamens; stigma blunt, often cleft, prominent; style and stigma very small in the florets of the ray; seed in the disk only, of various forms; seed-down various, or wanting; receptacle bristly.

**C. JA'CEA, *Brown Knapweed*:** scales of the calyx membranous, torn, the lower ones pinnatifid; leaves between lance-shaped and linear, root-leaves broader, toothed; flowers with rays; stem a foot high, erect, angular, branched; flowers solitary, terminal, light crimson, on tumid stalks; scales of the calyx

brown, the outer deeply pinnatifid, the inner terminating in a light brown, jagged lobe; perennial; flowers in August and September; grows in meadows and moist woods.

**C. NIGRA, *Black Knapweed*:** scales of the calyx lance-shaped, fringed at the tip with hair-like teeth; lower leaves lyre-shaped, upper ones between egg-shaped and lance-shaped; flowers without rays; stem from two to three feet high, woolly when young, afterwards rough; leaves rough; scales of the calyx tipped with an egg-shaped membranous expansion of a dark brown color, fringed with long linear teeth; flowers purple; perennial; flowers in July and August; grows in dry pastures.

These plants are exotic, but naturalized, and are now common. Some are troublesome weeds. The handsome *Blue-Bottle* or *Bachelor's Button*, *C. cyaneus*, belongs to this genus.

**CERASTIUM.** 10—4. Calyx inferior, of five egg-shaped, acute, permanent leaves, membranous at the edges; petals five, divided, obtuse, about the length of the calyx; filaments thread-like, generally ten, sometimes five or four, alternate one shorter; anthers roundish, two-

lobed; germen egg-shaped, superior, sessile; styles five, rarely four only, short; stigma bluntish, downy; capsule thin, egg-shaped or cylindrical, one-celled; seeds numerous, roundish, rough.

*C. VULGA'TUM*, *Broad-leaved Mouse-ear Chick-weed*: leaves egg-shaped, hairy; petals as long as the calyx; flowers longer than their stalks; root fibrous, small; stems numerous, from four to six inches long; leaves and stems hairy and pale-green; capsule twice as long as the calyx, cylindrical; annual; flowers in the summer months; grows in fields and waste ground; common.

*C. VISCO'SUM*, *Narrow-leaved Mouse-ear Chick-weed*: leaves between oblong and lance-shaped, hairy; flowers shorter than their stalks; roots fibrous, small; stems numerous, from four to eight inches long; leaves and stems hairy, dark green and clammy; perennial; flowers during the summer months; grows in fields and waste grounds; common.

*C. SEMIDECAN'DRUM*, *Small Mouse-ear Chick-weed*: leaves egg-shaped, inclining to oblong; petals slightly cleft; stamens five; stem generally branched, spreading at the base, three or four inches high; leaves and stems hairy, very clammy, and

generally covered with particles of sand and dust; annual; flowers in April and May; grows in sandy ground and on walls; common.

*C. ARVEN'SE*, *Field Mouse-ear Chick-weed*: leaves narrow, lance-shaped, fringed at the base; petals twice the length of the calyx; roots creeping; stems numerous, covered with fine deflected hairs, from four inches to a foot high; leaves and stem hairy; panicles few-flowered; petals large, white; perennial; flowers in the summer months; grows in fields and dry gravelly pastures.

*CHELIDONIUM*. Celandine. 13  
—1. Calyx inferior, of two roundish caducous leaves; petals four, equal, roundish, flat, narrower at the base; filaments about thirty, flat, broader upwards, shorter than the corolla; anthers oblong, compressed, erect, two-lobed; germen cylindrical, as long as the stamens; style none; stigma small, obtuse, cleft; pod linear, one-celled, with two undulated deciduous valves; seeds numerous, oval, dotted, arranged in two rows along a linear receptacle at each side of the pod.

*C. MA'JUS*, *Celandine*: root tapering; stem about two feet high, branched, enlarged at the joints, round, smooth, leafy; leaves deeply

pinnatifid, smooth; flowers in umbels, on long stalks; calyx tawny;



petals yellow; seeds black and shining. The juice of every part of the plant is yellow and acrid, removes warts, and is said to cure the itch. Perennial; flowers in May and June; grows in thickets and waste grounds, generally near houses.

**CHENOPODIUM.** 5—2. Calyx inferior, of one leaf, deeply divided into five egg-shaped, concave, permanent segments, membranous at the edges; corolla none; filaments awl-shaped, as long as the calyx; anthers roundish, two-lobed; germen round, depressed; styles short; stigmas obtuse; seed solitary, round, flattened, enveloped by the permanent, five-cornered calyx.

**C. RUBRUM, Red Goose-foot:** leaves triangular, somewhat diamond-shaped, deeply toothed and sinuate; racemes erect, compound, leafy; seed very minute; stems reddish; from one to two feet high; annual;

flowers in August and September; grows on waste ground.

**C. ALBUM, White Goose-foot:** leaves mealy, egg-shaped, inclining to diamond-shaped, jagged, entire at the base, the upper ones oblong, entire; clusters branched, somewhat leafy; seed smooth; stem branched, furrowed; the whole plant mealy; annual; July and August; grows in waste and cultivated ground.

**C. HYBRIDUM, Tall Goose-foot:** leaves heart-shaped, pointed, with broad angular teeth; clusters panicled, cymose, divaricate, leafless; stem rather slender, branched; the whole plant bright green and fetid; annual; flowers in August; grows in waste places.

**CHRYSANTHEMUM.** 19—2. Common calyx hemispherical, closely imbricated with numerous, roundish scales, membranous and dilated at the margin, the innermost terminating in a filmy appendage; compound corolla rayed; florets of the disk very numerous, perfect, tubular, with five equal, spreading segments; those of the ray more than twelve, strap-shaped, between elliptical and oblong, with three teeth; filaments hair-like, very short; anthers united into a cylindrical, notched tube; germen inversely egg-

shaped; style thread-shaped, a little longer than the stamens; stigmas oblong, spreading; seed oblong, or inversely heart-shaped, striated; seed-down none; receptacle a little convex, naked.

*C. LEUCANTHEMUM*, *Great White Ox-eye*, *White Weed*: leaves oblong,



cut, pinnatifid at the base, clasping the stem; root-leaves inversely egg-shaped, stalked; stem about two feet high, erect, furrowed; flowers large, solitary, terminal, with a yellow-disk, and white ray; perennial; flowers in June and July; grows in dry pastures, and by roads; common. This plant is an exotic, but is naturalized, and is now a very troublesome weed, sometimes covering whole acres, and presenting, in the early part of summer, one extended and unbroken sheet of white flowers. *C. SINEW-SIS*, *Chinese Chrys-*

*anthemum*, comprises all the varieties that are cultivated.

*CICHORIUM*. 19—1. Common calyx double, cylindrical, the outer of a few oblong, shortish scales, the inner of about eight linear, equal, permanent scales; compound corolla of about twenty strap-shaped, abrupt, deeply five-toothed, perfect florets; filaments hair-like, very short; anthers united into a five-cornered tube; germen egg-shaped; style thread-shaped, as long as the stamens; stigmas revolute; seed obscurely five-sided, abrupt; seed-down of several chaffy, erect bristles, shorter than the seed; receptacle somewhat chaffy.

*C. INTYBUS*, *Succory*: flowers in pairs, sessile; leaves runcinate;



stem two or three feet high, round, rough, branched; flowers large, bright blue, axillar; the roots are eatable, and have also been used as

a substitute for coffee; perennial; flowers in July and August; grows in borders of fields and by roads.

CICUTA. 5—2. Flowers uni-form, perfect, and nearly regular; calyx superior, of five broad, acute, somewhat unequal leaves; petals five, egg-shaped, or slightly heart-shaped, with an incurved point; filaments thread-like, spreading, as long as the corolla; anthers roundish; germen hemispherical, ribbed; styles thread-like, short, erect, little swelled at the base; stigmas obtuse; fruit nearly orbicular, heart-shaped at the base, a little compressed, crowned with the permanent calyx and recurved styles; seeds hemispherical, tumid, each with three double ribs.

C. MACULATA, *American Hemlock*: serratures of leaves mucronate;



leaf-stalks membranous, two-lobed; stem smooth, branched at top, hol-

low, striated, jointed; leaves compound, the lower three-ternate, upper ternate; stipules clasping the stem; leaflets oblong, acuminate, acutely serrate, or mucronate; umbels without a general involucre; partial umbels distinct with involucres of small narrow leaflets; calyx superior, of five minute, unequal leaves; petals five, obovate, with an incurved point; filaments thread-like, spreading, as long as the corolla; anthers roundish; fruit nearly orbicular, heart-shaped at the base, crowned with the permanent calyx and recurved styles; flowers white; July, August; height four to six feet; perennial; a dangerous plant, and highly poisonous; grows in wet meadows.

CIRCÆA. 2—1. Calyx of one leaf, superior, tubular at the base, the limb with two egg-shaped deflected segments; petals two, inversely heart-shaped, equal; filaments hair-like, as long as the calyx; anthers roundish; germen roundish; style thread-like; stigma dilated, notched; capsule universally egg-shaped, covered with hairs, two-celled, each cell one-seeded; seeds oblong.

C. ALPINA, *Mountain Enchanter's Night-shade*: stem ascending,

smoothish; leaves heart-shaped, toothed, shining; root spreading; whole plant nearly smooth; stem prostrate at the base, red; leaves pale green, delicate; flowers rose-colored, in short, terminal, and axillary bunches; perennial; in shady places, in woods, and among stones, in the lower parts of mountainous districts.

*C. LUTETIA'NA*, *Endlicher's Nightshade*: stem erect, hairy; leaves egg-shaped, denticulate; root spreading, difficult to be extirpated; stem little branched, generally with a solitary, terminal bunch of flowers; leaves dark green, opaque, hairy; flowers small, white or tinged with red; perennial; woods, copses, and shady lanes; flowers in June and July.

#### CITRUS. 18—2.

*C. LIMO'NUM*, *Lemon*: petioles somewhat winged; leaves oblong, acute, toothed; stamens numerous; fruit oblate with a rim, very acid; flowers white; May to July; height fifteen feet. The fruit of this tree is common enough everywhere, but the tree with us is only met with in nursery gardens, or as a house shrub. It is a beautiful little tree, and, loaded with its bright yellow fruit, which hangs from the stems

among its dark green, shining leaves, makes a very fine appearance. It is a native of temperate and tropical climates, and is easily cultivated in the northern states, requiring protection through the winter. *C. lime'ta* is a species which bears the *lime*, a smaller fruit, of similar quality; both are used to impart an acid flavor to drinkables, as punch and lemonade. *C. aman'tium* produces the delicious orange. This, too, is often met with in our gardens, and as a house shrub, and with its fruit is even more beautiful than the lemon.

*CNICUS*. 19—1. Common calyx swelled, imbricated, of numerous lance-shaped, thorn-pointed scales, permanent; compound corolla nearly uniform, equal, tubular, funnel-shaped florets, with a slender, recurved tube, the limb egg-shaped at the base, with five linear segments; filaments hair-like, very short; anthers united into a five-toothed, cylindrical tube, nearly as long as the corolla; stigma undivided, or cleft, oblong; seed inversely egg-shaped, with a slender, cylindrical point; seed-down sessile, feathery, very long; receptacle flat, covered with bristles as long as the tubes of the florets.

**C. LANCEOLATUS**, *Spear Thistle*: leaves decurrent, bristly, pinnatifid, their segments generally three-lobed, spreading in different directions, thorny; calyx egg-shaped, woolly, with lance-shaped, thorn-pointed scales, spreading above; stem branched, stout, from one to three feet high; leaves woolly beneath, with a very long and very sharp point; flowers large, purple, single or in pairs; biennial; flowers in July and August; grows by roadsides, and in waste places, dry pastures and neglected fields.

**C. ARVENSIS**, *Canada Thistle*: leaves sessile, pinnatifid, thorny; stem paniced; calyx egg-shaped, with closely pressed, minutely thorn-pointed scales; stem from two to four feet high, round, smooth, angular; leaves bare beneath; flower-stalks cottony; flowers pale purple; perennial; flowers in July; grows in corn-fields, pastures, and waste places; common. This thistle is a troublesome pest to the farmer, and in England is called *Cursed Thistle*. Bigelow says the "plant seems to have come to us from the westward." I remember hearing it first talked of as then making its unwelcome appearance on Massachusetts farms, about twenty-five years ago.

**CONVALLARIA**. *Lily of the Valley*. 6—1. Calyx none; corolla inferior, of one petal, bell-shaped, deciduous, with six obtuse segments; filaments awl-shaped—shorter than the corolla; anthers oblong, erect; germen globular; style thread-shaped, longer than the stamens; stigma triangular, obtuse; berry globular, three-celled; seeds two in each cell, roundish.

**C. MAJALIS**, *Lily of the Valley*: stalk naked, semi-cylindrical; clus-



ter simple; flowers drooping, cup-shaped; leaves two, radical, elliptical, ribbed, stalked, pale green; flowers white, elegant, sweet-scented; berry scarlet; perennial; flowers in May; grows in woods at the south.

**CONVOLVULUS**. *Bindweed*. 5—1. Calyx inferior, of one leaf, small, divided into five egg-shaped, permanent segments; corolla of one petal, large, bell-shaped, regular,



with five plaits and five shallow lobes; nectary a gland under the germen; filaments awl-shaped, half as long as the corolla; anthers arrow-shaped, erect, terminal; germen roundish; style thread-shaped, as long as the stamens; stigmas two, spreading; capsule roundish, seeds large, roundish.

*C. SEPNUM*, *Great Bindweed*: leaves arrow-shaped; flower-stalks square, bearing a single flower; bracteas heart-shaped, close to the flower; roots long, creeping; stems twining, several feet long; flowers large, white or tinged with rose-color; perennial; flowers in July and August; grows in thickets.

*C. ARVEN'SIS*, *Small Bindweed*: leaves arrow-shaped; flower-stalks



bearing a single flower; bracteas minute, remote from the flower; root creeping, long; stems twining or prostrate, several feet long; flow-

ers rose-colored, sometimes white; perennial; flowers in June and July; grows on dry banks, in pastures, &c.

In this interesting genus, which contains many species, is found the beautiful *Common Morning Glory*, which forms so rich an outer curtain to our south windows. The *Sweet Potato*, *C. batatas*, also belongs to this genus.

*CONIUM*. Hemlock. 5—2. Flowers all perfect, slightly irregular; calyx obsolete; petals five, superior, inversely heart-shaped, with an acute inflected point; the uttermost rather larger; filaments hair-like, scarcely so long as the corolla; anthers roundish; germen egg-shaped, a little compressed, furrowed, wrinkled; styles thread-shaped, spreading, a little swelled at the base; stigmas obtuse; fruit egg-shaped, slightly compressed, with ten prominent, acute ribs, crowned with the dilated, undulated, floral receptacle, and the spreading styles; seeds half egg-shaped, each with five acute ribs, the interstices flat.

*C. MACULATUM*, *Poison Hemlock*: stem much branched, polished and spotted; about three feet high; leaves large, repeatedly compound, with egg-shaped, pinnatifid leaflets; flowers numerous, white, all bearing

**seeds.** The whole plant is fetid and poisonous. It has been used in powder, extract and infusion, in cancerous diseases, and for chronic ulcers; perennial. Flowers in June and July; grows in waste ground.

**COPTIS.** 13—4.

**C. TRIFOLIA, Goldthread:** leaves trifid, with obovate, toothed, blunt,



three-lobed segments; scape one-flowered; leaf segments smooth, fine, veiny; calyx none; petals five to seven, oblong, concave; nectaries inversely conical; anthers roundish; styles recurved; flowers white; May. This little plant is found in thick woody swamps. Its fine, thread-like, creeping roots, of a bright yellow color, may be found just beneath the moss at the surface. They are intensely bitter, and are used in medicine. They are universally known as a remedy for sore mouths.

**CORNUS.** Dog-Wood. 4—1.

**C. FLORIDA, Dog-Wood, False Box:** leaves opposite, ovate, acuminate,

entire; involucre four-leaved; leaflets obcordate; fruit ovate.



This is a rather small tree, of from thirty to thirty-five feet in height, and when in flower extremely beautiful: At this time the leaves are just beginning to expand, and the tree appears entirely covered with its fine white flowers. It occurs in woods from Massachusetts to Florida. It is of slow growth, and the wood is very hard, compact, and heavy, being used for harrow teeth, cogs of mill-wheels, and other small work where these qualities are requisite. The bark is extremely bitter, and is used in medicine. Flowers in May.

**CORYLUS.** Hazel-Nut. 21—7.

Barren flowers: catkin cylindrical, imbricated all round with scales, each enclosing a single flower, narrower at the base, broader at the end, with three deep egg-shaped segments, the middle one largest and lying over the others; corolla none; filaments eight, very short,

hanging from the inner side of the scale; anthers oblong, two-celled, pendulous, shorter than the scale.

Fertile flowers at a distance from the others, from scaly buds; calyx double; the outer inferior, of one leaf, deeply divided, many flowered, finally enlarged, permanent; inner superior, minute, deciduous; corolla none; germen very small, egg-shaped, with rudiments of two seeds; styles two, very short; stigmas prominent, awl-shaped, downy, deciduous; nut egg-shaped, hard, compressed, downy at the top, one-celled, invested with the greatly enlarged outer calyx; kernel solitary, egg-shaped.

C. AMERICA'NA, *Hazel*: calyx of fruit roundish, campanulate, larger



than the nut; its border dilated, tooth-serrated; leaves roundish, cordate, acuminate; flowers in April; height five or six feet; grows in thickets, by woods and road-sides; common.

C. ROSTRATA, *Beaked Hazel*: stipules linear-lanceolate; calyx of fruit campanulate, tubular, larger than nut, two-parted, the segments cut-toothed; leaves oblong-ovate, acuminate; flowers in May; height four or five feet. Locality same as the last, which it resembles in appearance, the principal difference being in the calyx which envelopes the nut. In this species it is contracted so as to resemble a little bottle. It differs also in being covered with short stiff hairs. The nuts of both species are well tasted, but, owing probably to want of cultivation, are somewhat inferior to the European *filbert*. They are protected, while green, from the squirrels, and in some measure from boys, by the intensely acid calyx which covers them.

CRATÆGUS. Hawthorn. 12

—2. Calyx superior, of one leaf, with five permanent segments; petals five, round, from the edge of the calyx; filaments awl-shaped, incurved; anthers roundish, two-lobed; germen inferior, roundish; styles from two to five, thread-shaped, erect; stigma knobbed; apple globular, concave at the top, crowded with the calyx, with from two to five hard cells or capsules, each one-

valved ; seeds two in each cell, erect, inversely egg-shaped.

*C. CRUS-GAL'LI*, *Common Thorn* : branches thorny ; leaves three or five lobed, serrate, smooth ; flowers in terminal corymbs ; styles generally two, often one ; a small tree or shrub, with smooth bark ; thorns small, straight ; flowers white ; fruit mealy, deep red. The wood is very hard ; the flowers emit an agreeable odor ; and the berries, which remain upon the branches during the winter, are eaten by numerous species of small birds. Flowers in May, June ; grows in thickets and pastures.

CUPRESSUS. Cypress. 21—8.

*C. DISTICHA*, *Cypress* : leaves distichous, flat, deciduous, four or five inches long ; leaflets small, fine, somewhat incurved ; male flowers paniculate, leafless ; cone spherical. This beautiful tree is common in the southern states and Mexico, where it occupies wet soils and occurs in dense masses, called *Cypress Swamps*, sometimes to the extent of thousands of acres. In these situations, it is frequently met with of the height of one hundred and twenty feet, with a trunk from twenty-five to forty feet in circumference above the conical base, which at the sur-

face of the earth is always three or four times as large as the continued diameter of the trunk : in felling them the negroes are obliged to raise themselves upon scaffolds five or six feet from the ground. The base is usually hollow for three-fourths of its bulk, and is less regularly shaped than that of the large tupelo. Its surface is longitudinally furrowed with deep channels, whose ridges serve as cramps to fix it more firmly in the loose soil. The roots of the largest stocks, particularly of such as are most exposed to inundation, are charged with conical protuberances, commonly from eighteen to twenty-four inches, and sometimes four or five feet in thickness ; they are always hollow, smooth on the surface, and covered with a reddish bark like the roots, which they resemble, also, in the softness of their wood ; they exhibit no sign of vegetation, and no cause can be assigned for their existence ; they are peculiar to this tree, and begin to appear when it is twenty or twenty-five feet in height ; they are not made use of except by the negroes for beehives. Amidst the pine forests and *savannas* of the Floridas, is seen here and there a bog or a splash of water filled with

cypresses, whose squalid appearance, when they exceed eighteen or twenty feet in height, proves how much they are affected by the barrenness of a soil which differs from the surrounding waste only by a layer of vegetable mould a little thicker upon the quartzous sand. The summit of the cypress is not pyramidal like that of the spruces, but is widely spread and even depressed upon old trees. The foliage is open, light, and of a fresh agreeable tint; each leaf is four or five inches long, and consists of two parallel rows of leaflets upon a common stem. The leaflets are small, fine, and somewhat arching, with the convex side outwards. In autumn they change from a light green to a dull red, and are shed soon after.

This tree blooms in Carolina about the first of February. The male and female flowers are separately borne by the same tree, the first in flexible pendulous aments, and the second in bunches scarcely apparent. The cones are about as large as the thumb, hard, round, of an uneven surface, and stored with small, irregular, ligneous seeds, containing a cylindrical kernel; they are ripe in October, and re-

tain their productive virtues two years.

The wood is fine-grained, and after being for some time exposed to the light, of a reddish color: it possesses great strength and elasticity, and is lighter and less resinous than that of the pines. To these properties is added the faculty of long resisting the heat and moisture of the southern climate. The color of the bark and the properties of the wood vary with the nature of the soil; the stocks which grow near the natural bed of the rivers, and are half the year surrounded with water to the height of three or four feet, have a lighter-colored bark than those which stand retired in places that the waters do not reach, or where they sojourn but a moment. The wood, also, is whiter, less resinous and less heavy. These are called *White Cypresses*. The others, of which the bark is browner and the wood heavier, more resinous, and of a dusker hue, are called *Black Cypresses*. When destined to be employed in the arts, both varieties should be felled in the winter, and kept till, by a long process, the wood has become perfectly dry. A resin of an agreeable odor and a red color exudes from the cy-

press; it is not abundant enough to be collected for commerce, though more copious than that of the white cedar, which is probably the reason of the wood being denser and stronger; it is preferred to that of the pines for the dressing of suppurating wounds. By boiling the leaves three hours in water they afford a fine durable cinnamon color. This wood is extensively employed for building wherever it abounds. Of whatever materials the building is constructed, the roof is universally covered with cypress shingles, which, if made of trees felled in the winter, last forty years. Cypress boards are preferred to those of pine for the inside of brick houses, and for window sashes, and the pannels of doors exposed to the weather: cabinet-makers also choose it for the inside of mahogany furniture. It is highly proper for the masts and sides of vessels, and wherever it grows it is chosen for canoes, which are fashioned from a single trunk, and are often thirty feet long and five feet wide, light, solid, and more durable than those of any other tree. It makes the best pipes to convey water under ground; especially the black variety, which is more resinous and solid.

C. THYOIDES, *White Cedar*: branches compressed; leaves imbricated four ways, ovate, warted at the base; cone spherical. This tree grows to the height of seventy or eighty feet, with a diameter of about three feet. The foliage is evergreen; each leaf is a little branch numerously subdivided, and composed of small, acute, imbricated scales; in



the angles of these ramifications grow the flowers, which are scarcely visible, producing very small, rugged cones. It is rare in the northern and eastern states, but becomes plenty in New York, New Jersey, and Pennsylvania, occurring in swamps, forming dense masses. It extends south until it is supplanted by the cypress. The wood is light, soft, fine-grained, and easily wrought. It has an agreeable, strong, aromatic odor, which it retains as long as it is kept dry. It is extensively used in the manufacture of pails, and similar wares.

Its durability, exposed to the alternate dryness and moisture of the weather, is astonishing; fences constructed of the young stocks last fifty or sixty years.

**CYNOGLOSSUM.** Hound's Tongue. 5—1. Calyx inferior, of one leaf, deeply five-cleft; segments slightly acute; corolla of one petal, funnel-shaped, little longer than the calyx; tube cylindrical, short; mouth half closed, with five horizontal valves; filaments short; anthers roundish; germens four, depressed; style awl-shaped, central, longish; stigma small, notched; seeds four, roundish, imperforate at the base, attached to a central receptacle.

**C. OFFICINALE**, *Hound's Tongue*: stamens shorter than the corolla; stem-leaves broadly lance-shaped, sessile, downy; whole plant dull-green, downy, and soft; stem two feet high; root-leaves large, tapering at both ends; clusters terminal, paniced; corolla dull crimson. This plant is suspected of possessing narcotic properties; its smell is very disagreeable, and greatly resembles that of mice. Perennial; flowers in July; grows by road-sides.

**C. SYLVATICUM**, *Green-leaved Hound's Tongue*: stamens shorter than the corolla; leaves lance-shap-

ed, the upper ones embracing the stem, smooth above, hairy beneath; whole plant bright green; leaves covered on the back part with callos warts; flowers dull blue; biennial; flowers in June; grows in shady lanes; rare; grows at the south.

**CYPRIPEDIUM.** 20—2. Calyx superior, of three lance-shaped, spreading, colored leaves, the upper ones broadest; petals two, about the same length, spreading, narrow, lance-shaped; nectary spurless, with an inflated, obtuse, prominent lip, having an irregular longitudinal fissure above; filaments two, on the style, lateral, oblong; anthers lateral, elliptical; germen oblong, triangular; style short, somewhat compressed, terminating above the stamens in a dilated lobe; stigma beneath this lobe, and parallel to it, dilated and flattened; capsule oblong, angular; seeds oblong, numerous.

**C. CALCEOLUS**, *Yellow Ladies' Slipper*: stem leafy; terminal lobe of the style elliptical, obtuse, channelled; lip somewhat compressed, shorter than the petals; root tuberous, branching; stem a foot high; flower solitary, perennal, large, dark-brown; perennal; flowers in June; grows in woods.

**C. ACAULÉ**, *Ladies' Slipper*: scape leafless, one-flowered; root-leaves two, oblong, obtuse; stem without leaves; nectary large, of a light purple color; flowers in May, June; height six or seven inches; perennial; grows in woods.

**C. SPECTABILE**, *Tall Ladies' Slipper*: stem leafy; lobe of column elliptical, cordate, blunt; lip shorter



than sepals, compressed; flowers two or three; the lip much striped with purple and white, large; July; height two feet; perennial.

There are other species of this genus indigenous here; they are all handsome and interesting plants, and have been introduced into the gardens of Europe, where they are much thought of. They are readily known by their large, curious, inflated nectaries, which are shaped something like a colt's foot.

## D.

### DATURA. 5—1.

**D. STRAMONIUM**, *Apple Peru, Thorn-apple*: leaves ovate, smooth, angular, toothed; pericarp prickly; flowers white with a tinge of purple; August, September; height three feet; annual. This is a well-known plant, growing among the rubbish of waste grounds.

**D. TA'TULA**, *Blue Thorn-apple*: leaves ovate, subcordate, smooth, angular, toothed; stem spotted; pericarp prickly; flowers blue; August, September; height three feet; common with other species.

Every part of these plants is poisonous, but owing to its extremely disagreeable odor, little danger of its being eaten by children is to be apprehended. It is used in medicine for asthma, &c.

**DAPHNE. 8—1.** Calyx inferior, of one leaf, tubular, withering; tube cylindrical, closed, longer than the limb, which is divided into four egg-shaped, colored segments; corolla none; filaments short, in two rows; anthers roundish, two-celled, erect; germen egg-shaped; style very short; stigma knobbed, depressed;



berry oval, one-celled; seed single, oval, large.

**D. ODOÏRA**: head terminal, sessile, many-flowered; leaves scattered, oblong, lanceolate, smooth. This species is a common and very interesting green-house shrub. With its fine green laurel-like leaves it is very beautiful, and the fragrance of its small, spicy, clustering flowers, is not exceeded by those of any other plant. It is a native of China.

**DAUCUS**. Carrot. 5—2. Flowers separated; the outermost irregular and barren; inner fertile, the central one generally neutral, often colored; calyx obsolete; petals inversely heart-shaped, with an inflected point, irregular; filaments hair-like, spreading, longer than the corolla; anthers oblong; germen inferior, egg-shaped, bristly, imperfect in the outermost and central flowers; styles thread-shaped, spreading, dilated at the base; stigmas obtuse; fruit oblong, compressed; seeds with four principal ribs, having each a row of flattish, straight, or hooked prickles, and rough intermediate ribs; their inner surfaces flat and closely applied.

**D. CAROTA**, *Wild Carrot*: bristles of the seed slender; leaflets pinnatifid, their segments between linear

and lance-shaped, acute; umbel having in the centre a solitary colored flower, when in fruit concave; root tapering, yellow, sweet, slightly aromatic, bearing no resemblance in taste or color to the cultivated carrot, which is said to be produced from it; stem from one to two feet high, bristly; umbels terminal, the central flower dark purple. The roots are eaten by the Hebridians. Biennial; flowers in June and July; grows in pastures and the borders of fields.

**DIANTHUS**. Pink. 10—2. Calyx inferior, of one leaf, cylindrical, striated, permanent, with five teeth at the mouth, and two or more pairs of opposite imbricated scales at the base; petals five, their claws as long as the calyx, narrow, and angular; the limbs flat, dilated towards the end, obtuse, variously notched; filaments awl-shaped, as long as the calyx, spreading at the top; anthers oblong, compressed; germen oval; styles two, awl-shaped, longer than the stamens; stigmas revolute, tapering; capsule cylindrical, one-celled, opening with four teeth; seeds numerous, roundish, compressed.

**D. ARMERIA**, *Wild Pink*: flowers aggregate; scales of the calyx lance-

shaped, downy, as long as the tube; stem about a foot high, corymbose above; flowers small, speckled pink and white; annual; flowers in July and August; grows in pastures.

This beautiful and much admired genus of plants contains many species, the present being the only one I find mentioned as indigenous to the United States. They consist of all the plants known as pinks, carnations and *sweet-williams*. The foliage of most of them is evergreen, preserving their vivid green color through the winter. *D. CARYOPHYLLUS*, the *clove pink*, is thought to be the source of all the different varieties of carnation, which amount to about four hundred. We may judge of the estimation in which these plants have always been held, by the name, *Dianthus* being composed of the Greek word *Dios*, (God,) and *anthos*, (a flower,) the flower of God, or divine flower.

**DIGITALIS.** Foxglove. 14—2. Calyx of one leaf, deeply divided into five roundish, acute segments, the upper narrower; corolla bell-shaped; tube large, cylindrical at the base, dilated and bulging upwards; limb small, with four unequal segments, the upper recurved and slightly cleft, the lower largest;

filaments awl-shaped, arising from the tube of the corolla, declining; anthers cleft, acute; style thread-shaped, as long as the stamens; stigma cleft, acute; capsule egg-shaped, pointed, two-celled, two-valved, with a double partition formed by the inflected margins of the valves.

*D. PURPUREA*, Foxglove: segments of the calyx egg-shaped, acute; corolla obtuse, its upper lobe scarcely cleft; leaves egg-shaped, downy; stem erect, from two to four feet high; leaves alternate, crenate, wrinkled and veined; cluster terminal, erect, simple, with numerous large, pendulous, crimson flowers, elegantly mottled, and hairy within. Infusion and tincture of the leaves are used in dropsy and for diminishing the rapidity of the pulse in inflammations. This is a most elegant and showy cultivated plant. Biennial; flowers in June and July.

**DIONÆA.** 10—1.

*D. MUSCIPOLA*, Venus's Fly-trap: the leaves of this most singular plant are each terminated by an appendage of two lobes, with a gland in a cavity at the bottom which secretes a fluid attractive to flies. The edges of the lobes are furnished

with long spines or bristles; and at the bottom of the cavity are



three sharp points projecting upwards. Whether all this contrivance is intended as a snare, I cannot say, but whenever an unlucky insect alights on it, the lobes instantly close, catching him

“as cleverly as the ablest trap,” and pressing him down upon the points, thus impale him alive. From the middle of the leaves rises the flower-stalk, terminated by an umbel-like corymb of small, white flowers. Grows in wet places in the southern states.

#### DIOSPYROS. 23—2.

*D. VIRGINIANA*, *Persimon*. The banks of the river Connecticut, below the forty-second degree of latitude, may be considered as the northern limit of this tree; but it is rendered rare in these parts by the severity of the winter, while in New Jersey it is common, and still

more so in Pennsylvania, Maryland and the southern states: it abounds, also, in the western forests. The persimon varies surprisingly in size in different soils and climates. In New Jersey it is not more than half as large as in the more southern states, where, in favorable situations, it is sometimes sixty feet in height and eighteen or twenty inches in diameter. The trunk of a full-grown tree is covered with a deeply-furrowed blackish bark, from which a greenish gum exudes, without taste or smell. The leaves are from four to six inches in length, oblong, entire, of a fine green above and glaucous beneath; in autumn they are often variegated with black spots. The terminal shoots are observed to be usually accompanied, at the base, by small, rounded leaves. This tree belongs to the class of vegetables whose sexes are confined to different stocks. Both the barren and fertile flowers are greenish and not strikingly apparent. They put forth in June or July. The ripe fruit is about as large as the thumb, of a reddish complexion, round, fleshy, and furnished with six or eight semi-oval stones, slightly swollen at the sides, and of a dark purple color. It is not eatable till it has been touch-

ed with frost, by which the skin is shrivelled, and the pulp, which before was hard and extremely harsh to the taste, is softened and rendered palatable. The fruit is so abundant in the southern states, that a tree often yields several bushels. In the south it adheres to the branches long after the shedding of the leaf, and when it falls it is eagerly devoured by wild and domestic animals.

The fresh sap wood is of a greenish color, which it preserves after it is seasoned, and the heart wood is brown, hard, compact, strong and elastic. It is employed for screws, tinmen's mallets, and shoe lasts. It is used by coach makers for the shafts of chaises, and is found preferable to the ash. The fruit is sometimes pounded with bran, and formed into cakes, which are dried in an oven, and kept to make beer, for which purpose they are dissolved in warm water with the addition of hops and leaven.

DIPSA'CUS. 4—1. Involucre many-flowered, of many spreading, permanent leaves; calyx superior, double, short, undivided; corolla of one petal, tubular; the limb four-lobed, the outer lobe larger; filaments hair-like, longer than the co-

rolla; anthers oblong, fixed sidewise; germen inferior; style thread-like, as long as the corolla; stigma simple; seed naked, solitary, oblong, crowned with the calyx; common receptacle conical, covered with scales.

D. SYLVES'TRIS, *Wild Teasel*: leaves opposite, serrated; scales of the receptacle straight; involucre bent inwards, longer than the head of flowers; about four feet high; leaves lance-shaped; heads large; biennial; flowers in July; grows by road-sides.

D. FULLO'NUM, *Fuller's Teasel*: leaves united, serrate; scales of the receptacle bent backwards; involucre spreading; root fleshy, tapering; stem five or six feet high, erect, furrowed, prickly, branched above; leaves oblong, sessile, united at the base, serrate; flowers whitish; cultivated for the use of clothiers, who employ the scales of the receptacle to raise the nap upon woollen cloths. For this purpose the heads are fixed round the circumference of a large broad wheel, which is made to turn round, and the cloth is held against them. Biennial; flowers in July.

DIR'CA. 8—1.

D. PALU'STRIS, *Leather-wood*. This

is an irregular shrub, about six feet in height, flowering in April and



long as the calyx; anthers small, roundish; germen roundish; styles from six to eight, simple, as long as the stamens; stigmas club-shaped; capsule egg-shaped, one-celled, with three or four valves; seeds numerous, minute, inversely egg-shaped, attached to the middle of each valve.

*D. ROTUNDIFOLIA*, *Round-leaved Sun-dew*: leaves round, on hairy

May, before the leaves have begun to put forth. The flowers are small, yellow, and without a calyx; the corolla funnel-shaped, slightly toothed on the margin. The stamens are much longer than the corolla, eight in number, and placed a long and short one alternately; fruit a small oval red berry. Every part of this shrub is remarkably tough, the twigs being used for making baskets and tickling the legs of mischievous boys, and the bark for ropes, &c. Grows in woods and swamps throughout the United States.

*DROSERA*. Sun-dew. 5—5. Calyx inferior, of one leaf, deeply divided into five acute, permanent segments; petals from five to eight, nearly egg-shaped, obtuse; filaments from five to eight, awl-shaped, as



stalks; flower-stalks from the root, forming a simple cluster; leaves from the root, numerous, lying close to the ground, tapering into a flat hairy stalk, and beset with red hairs, discharging a drop of clammy fluid from their tips; petals five, white; perennial; flowers in July and August; grows in bogs.

*D. LONGIFOLIA*, *Long-leaved Sun-dew*: leaves inversely egg-shaped, on smooth stalks; flower-stalks from the root, forming a simple cluster; leaves from the root, numerous, ascending, tapering into a

flat, smooth stalk, and beset with hairs, as in the last species; petals white; perennial; flowers in July and August; grows in bogs.

## E.

**ECHIUUM.** 5—1. Calyx inferior, of one leaf, permanent, five-cleft; the segments awl-shaped; corolla of one petal, bell-shaped; tube very short; limb gradually widening upwards; segments five, the two uppermost longest, the lower smallest; mouth open and naked; filaments as long as the corolla, awl-shaped, unequal; anthers oblong, fixed sideways; germens four; style thread-shaped, long; summit blunt, cleft; seeds four, roundish, wrinkled, obliquely pointed.

**E. VULGARE**, *Common Vipers' Bugloss*: stem rough with bristles and tubercles; stem-leaves lance-shaped, bristly; spikes lateral, hairy, deflected; stems from one to two feet high, round, bristly; leaves alternate, entire, dull green; the lowest stalked, all bristly; flowers large, crowded, beautiful, bright purplish blue; perennial; flowers in June and July; grows in corn-fields and waste ground.

**EMPETRUM.** 22—2. Barren flowers: calyx deeply divided into three egg-shaped, permanent segments; corolla of three oblong petals, larger than the calyx; filaments from three to nine, hair-like, long, pendulous; anthers roundish, deeply cleft, two-celled.

Fertile flowers: calyx deeply divided into three egg-shaped, permanent segments; corolla of three oblong petals, larger than the calyx; germen superior, round, depressed; style very short, erect; stigmas nine, oblong, spreading; berry globular, depressed, wider than the calyx, one-celled; seeds nine, triangular, closely arranged in a circle.

**E. NIGRUM**, *Common Crow-berry*: stem and branches procumbent;



leaves between linear and oblong. A small procumbent shrub, with numerous slender branches; leaves fringed at the edges; flowers reddish, axillar; berries black;

eaten by birds. They are not unpleasant, and appear to be perfectly wholesome. Flowers in May; grows on mountains.

**EPILOBIUM.** 8—1. Calyx superior, of one leaf, deeply divided into four oblong, colored, deciduous segments; petals four, circular, broadest at the outer part, notched, inserted between the segments of the calyx; filaments awl-shaped, four alternate ones shorter; anthers oval, compressed, obtuse; germen inferior, cylindrical, very long; style thread-shaped; stigma thick, blunt, generally four-cleft; capsule quadrangular, very long, four-celled, four-valved; partitions opposite the valves; seeds numerous, oblong, small, crowned with down.

**E. ANGUSTIFOLIUM,** *Rose-bay Willow-herb*: leaves scattered, be-



tween linear and lance-shaped, veined, smooth; petals unequal; stamens declining; stems from three

to six feet high; flowers rose-colored, numerous, in long, terminal, erect clusters; perennial; flowers in July and August; grows in moist meadows and shady places.

**E. LINEARE,** *Linear Willow herb*: stem ternate, pubescent, branched at top; stem-leaves opposite; branch-leaves alternate, linear, entire, revolute at the margin; flowers few, terminal, axillary; grows in moist woods; flowers in August; perennial.

**E. ALPIMUM,** *Alpine Willow-herb*: leaves elliptical, obtuse, nearly entire, on short stalks; stem decumbent, two or three-flowered; root creeping; stems three or four inches long; flowers generally two, rose-colored; perennial; flowers in June and July; grows on the edges of hills on the White mountains.

**EQUISETUM.** 24—2. Spike oblong, of many peltate, stalked scales, arranged on a common stalk; scales angular, bearing at the back from four to seven oblong membranous cells, parallel to each other, finally bursting into two equal valves; seeds globular, very minute, having four spiral filaments attached to their base, which terminate each in a flat appendage or anther, producing pollen.

**E. ARVENSE, Corn Horse-tail:** sterile stems decumbent at the base, with undivided, angular, roughish ascending branches; fertile stems erect, destitute of branches, their sheaths distant, deeply toothed; fertile stems about eight inches high, appearing before the sterile ones, which are from one to two feet high; perennial; flowers in April; grows in fields and meadows.

**E. SYLVATICUM, Wood Horse-tail:** sterile and fertile stems with compound, four-sided, smooth branches, curved downwards; stems about a foot high, erect, with short branches, each whorl with a pale brown torn sheath above it; spike oblong; perennial; flowers in April and May; grows in moist woods.

**E. LIMOSUM, Smooth Naked Horse-tail:** sterile and fertile stems naked, or branched at the upper part; the branches about fifteen in each whorl, simple, smooth, ascending; stems from two to three feet high, smooth to the touch, furrowed, sometimes branchless, more frequently branched; spike small, oblong; perennial; flowers in June and July; grows in marshes and at the edges of lakes and rivers.

**E. PALUSTRE, Marsh Horse-tail:** sterile and fertile stems deeply fur-

rowed, branched throughout; branches about ten in each whorl, minutely roughish, erect; stems about two feet high; spike cylindrical. Perennial; flowers in June and July; grows in watery places.

**E. HYEMALE, Greater Rough Horse-tail:** sterile and fertile stems generally branchless, sometimes branched at the base, very rough, furrowed; sheaths whitish, black at the top and bottom, their teeth pointed, deciduous; stems from one to two feet high; spike elliptical. Perennial; flowers in July and August; grows in boggy woods; not common. The cuticle of all the *Equiseta* contains silicious earth, on which account they are used for polishing wood and metals.

**EUPATORIUM. 19—1.** Common calyx oblong, imbricated, with lance-shaped, unequal, erect, thornless scales; compound corolla uniform, level, of a few perfect, regular, funnel-shaped florets; filaments hair-like, very short; anthers united, with a cylindrical tube, as long as the corolla; germen small, oblong, angular; style thread-shaped, very long, cleft as far down as the anthers; stigmas oblong, downy, spreading; seed oblong, angular; seed-down sessile, rough or feath-



ery, permanent; receptacle naked, small.

*E. PERFOLIATUM*, *Boneset*, *Thorough-wort*, *Fever-wort*: leaves con-



nate, perfoliate, serrate, wrinkled underneath, downy; stem erect, round, hairy; flowers in corymbs; peduncles hairy; calyx imbricate, the scales hairy. Flowers white; August to October; height about two feet; perennial. The whole plant is bitter and used in medicine; grows in moist grounds.

*E. AROMATICUM*, *Aromatic Eupatorium*: leaves stalked, ovate, acute, three-nerved, bluntly serrate, glabrous; stem paniced upwards; flowers corymbose. Flowers white, July; height about four feet; annual. A beautiful species, with large, fragrant flowers, found in dry woods.

There are many species of eupatorium, some of which may be seen in almost every moist place by our road-sides. They are generally rank, showy plants, and may be

known by their rough-looking leaves, which, in most species, are perforated by the stem.

## F.

*FAGUS*. Beech. 21—7. Barren flowers in a roundish or cylindrical catkin; calyx of one leaf, divided into five or six segments; corolla none; filaments from five to twenty, hair-like, longer than the calyx; anthers roundish or oblong, two-lobed.

Fertile flowers stalked; calyx double; the outer inferior, leathery, externally prickly, with four, five, or six deep segments, containing two or three flowers; the inner superior, of one leaf, with five or six deep segments, internally woolly; corolla none; germen two or three, below the inner calyx, egg-shaped, compressed or angular, three or six-celled, with rudiments of two seeds in each cell; styles three or six, short; stigmas oblong, undivided, permanent; nuts two or three, egg-shaped, more or less angular, leathery, one-celled, attached to the base of the outer calyx, and crowned by the upper; kernels one, two, or three.

*F. FERRUGINEA*, *Beech Tree*, *Red*

*Beech*: leaves ovate, acuminate, downy underneath, with large teeth,



ciliate at the margin; calyx of the fruit ovate, thin, covered with soft pericles, containing two nuts, of a triangular form, in a very tough, smooth skin. This Beech is confined to the north-east part of the United States, Canada, New Brunswick, and Nova Scotia. Its wood is fine-grained, tough, and strong, but not durable when exposed to the weather. It is used for shoe-last, carpenter's tools, &c., and for fuel. Height forty or fifty feet, with a trunk rather large in proportion, covered with a very smooth bark. The nuts are agreeable but small, and enter into the bill of fare of hogs and wild animals.

**FICUS.** Fig Tree. 23—2. *F. carica* is the species which produces the fig, a well-known fruit of the shops. It is supposed to be a native of Asia, but is now cultivated in the south of Europe. Within a few

years, it has been cultivated in the southern states, and in the northern is common as a green-house, or room shrub. Of this genus is the famous *Banian-tree*, *F. indica*, with a summit three or four hundred feet in diameter. This canopy is supported by natural pillars which the horizontal branches send out at intervals, which, growing downwards, reach the ground, in which they take root, presenting the remarkable appearance of a single tree with several trunks, sometimes as many as fifty or sixty.

**FRAGARIA.** 12—3.

*F. virginiana*, *Wild Strawberry*: calyx of the fruit spreading; hairs of the petioles erect, of the peduncles appressed; leaves smooth above. The flavor of the wild strawberry, when growing in warm open situations, is superior to that of the cultivated; but in shady places becomes insipid and sometimes sour.

The genus contains several species, all producing fruit in high esteem.

**FRAXINUS.** Ash Tree. 23—2. Calyx none, or in four deep segments; corolla none, or in four deep segments; filaments short; anthers large, with four furrows; germs

superior, egg-shaped, two-celled; style short; stigma cleft; capsule lance-shaped, flat.

**F. AMERICANA, White Ash:** leaflets stalked, oblong, shining, acuminate, entire, or slightly toothed, glaucous beneath; buds yellowish; flowers in May; height seventy or eighty feet. This is one of the most valuable trees of the American forests, as well as one of the most beautiful. Its fine trunk, sometimes three feet in diameter, and extending without a single branch for more than forty feet, furnishes a very light, strong, elastic timber, which renders it superior to that of any other tree for a great variety of purposes, where these qualities are requisite. It is always preferred for the shafts and frames of carriages, scythe snaths, rake handles, and many light wooden wares for household purposes, for ship's blocks, belaying pins, oars, handspikes, &c. Another desirable property is its remarkably rapid growth. Its beautiful foliage consists of leaves twelve or fourteen inches long, opposite, and composed of three or four pair of leaflets terminated by an odd one. The flowers are succeeded by long, winged capsules, in bunches four or five inches long, which remain

through the summer, the seeds ripening early in autumn. This tree prefers a cold climate, and is abundant in the northern part of the United States, Canada, and New Brunswick.

**F. PLATYCARPA, Carolina Ash.** This species of ash is confined to the southern states. It abounds particularly on the river Cape Fear in North Carolina, and upon the Ashley and the Cooper in South Carolina. The marshy borders of creeks and rivers, and all places exposed to long inundations, are congenial to this ash, which delights in more abundant moisture than the other species.

Its vegetation is beautiful, but its stature rarely exceeds thirty feet, and it fructifies at half this height. In the spring the lower side of the leaves and young shoots are covered with thick down, which disappears at the approach of summer. The leaves commonly consist of two pair of leaflets with a terminal odd one. The leaflets are large, nearly round, petiolated and distinctly toothed. The flowers, as in the other species, are small and not very conspicuous; the seeds, unlike those of any other ash with which we are acquainted, are flat,

oval and broader than they are long.

From its inferior dimensions this tree is not much used in the arts; although it possesses properties of eminent utility.

*F. QUADRANGULA'TA, Blue Ash.*  
The blue ash is unknown to the



Atlantic parts of the United States, and is found only in Tennessee, Kentucky, and the southern part of Ohio. It requires the richest soil to bring this tree to perfection.

The blue ash frequently exceeds sixty or seventy feet in height and eighteen or twenty inches in diameter. Its leaves are from twelve to eighteen inches long, and are composed of two, three or four pair of leaflets with an odd one. The leaflets are large, smooth, oval-acuminate, distinctly toothed and support-

ed by short petioles. The young shoots to which the leaves are attached are distinguished by four opposite membranes, three or four lines broad and of a greenish color, extending through their whole length; this character disappears the third or fourth year, leaving only the traces of its existence. The seeds are flat from one extremity to the other, and a little narrowed towards the base.

The wood of the blue ash possesses the characteristic properties of the genus, and of all the species of the western states it is the most extensively employed and the most highly esteemed. Besides the habitual use that is made of it for the frame of carriages and for the felloes of wheels, it is generally selected for the flooring of houses, frequently for the exterior covering, and sometimes for the shingles of the roof; but for the last purpose the tulip tree is preferred. It is said that a blue color can be extracted from the bark of this tree.

*F. SAMBUCIFOLIA, Black Ash.* In the extensive country comprising the northern section of the United States and the provinces of New Brunswick and Nova Scotia, the white ash and the black ash, which

is sometimes called *Water Ash* and *Brown Ash*, are the most abundant in the forests and the most perfectly known to the inhabitants. The black ash requires a moister soil than the white ash, and longer exposed to inundations.

The black ash is sixty or seventy feet high and about two feet in diameter. It is easily distinguished from the white ash by its bark, which is of a duller hue, less deeply furrowed, and has the layers of the epidermis applied in broad sheets. The buds are of a deep blue, and the young shoots of a bright green sprinkled with dots of the same color, which disappears as the season advances. The leaves at their unfolding are accompanied by stipulæ, which fall after two or three weeks: they are twelve or fifteen inches long when fully developed, and composed of three or four pair of leaflets with an odd one. The leaflets are sessile, oval-acuminate, denticulated, of a deep green color, smooth on the upper surface, and coated with red down upon the main ribs beneath: when bruised they emit an odor like that of elder-leaves. Its flowers open in May or June; they are of a greenish color, and are succeeded by seeds disposed

in bunches four or five inches long, flat, and, like those of the blue ash, are nearly as broad at the base as at the summit.

The perfect wood is of a brown complexion and fine texture; it is tougher and more elastic than that of the white ash, but less durable when exposed to the vicissitudes of dryness and moisture, and for this reason it is less extensively used. Coach-makers do not employ it, and it is never wrought into oars, hand-spikes and pulleys. In New Hampshire and the state of Maine it is preferred to the white ash for hoops, which are made of saplings from six to ten feet in length split in the middle. As this wood may be separated into thin, narrow strips, by malling, it is selected in the country for the bottoms of chairs, for baskets and riddles. This wood is more liable than any other species to be disfigured with knobs, which are sometimes of a considerable size, and are detached from the body of the tree to make bowls. The wood of these excrescences has the advantage of superior solidity, and when carefully polished exhibits singular undulations of the fibre; divided into thin layers it might be employed to embellish mahogany.

The ashes of this wood are singularly rich in alkali, from which, in Vermont and New Hampshire, great quantities of potash are made.

*F. TOMENTOSA, Red Ash.* Of all the ashes, this species is the most multiplied in Pennsylvania, Maryland and Virginia. Like the white ash, it prefers swamps, and places frequently inundated or liable to be covered with water by copious rains. The red ash is a beautiful tree, rising perpendicularly to the height of sixty feet, with a diameter of fifteen or eighteen inches. It is inferior to the white ash not only in size but in the rapidity of its growth: the length of the annual shoots and the distance of the buds are but half as great as in the white ash. The bark upon the trunk is of a deep brown color. The leaves are from twelve to fifteen inches long, and are composed of three or four pair of very acuminate leaflets, terminated with an odd one. Their lower surface, as well as the shoots of the same season to which they are attached, is covered with thick down: on insulated trees this down is red at the approach of autumn, whence, probably, is derived the name of the tree. It puts forth greenish flowers in May, which are

followed by seeds, similar in form and arrangement, though shorter, to those of the white ash.

The wood of this species is of a brighter red than that of the white ash, and possesses all the properties for which the other is esteemed, and in the middle and northern states they are indifferently applied to the same diversified uses; that of the red ash, however, is somewhat harder, and consequently less elastic.

*F. VIRIDIS, Green Ash.* The green ash is more common in the western districts of Pennsylvania, Maryland and Virginia than in any other part of the United States; but even here it is less multiplied than the white ash and black ash. It is found on the islands of the Susquehannah, and grows most abundantly on the banks of the Monongahela and the Ohio. This tree attains the height of twenty-five or thirty feet, with a diameter of four or five inches. It may be easily recognised by the brilliant color of the young shoots and of its leaves, of which the two surfaces are nearly alike, are from six to fifteen inches in length, according to the vigor of the tree and to the coolness of the soil, and are composed of three, four or five pairs

of petiolated, oval-acuminate and distinctly denticulated leaflets, surmounted by an odd one. It puts forth greenish flowers in May, which are succeeded by seeds, similar in form to those of the white ash, though only half as large. The wood of the green ash is distinguished by the same properties with that of the preceding species; but as the others are common in the same regions, and are so much superior in size, it is only accidentally employed.

### G.

#### GALEOP'SIS. Hemp-nettle. 14

—1. Calyx of one leaf, tubular, with five spreading, thorn-tipped teeth, as long as the tube; corolla gaping; tube slender at the base, dilated at the throat, which has two prominences, hollow beneath, in front; upper lips vaulted, roundish, serrate at the end; lower lip deeply three-lobed, the lateral lobes roundish, the middle one larger, cleft and crenate; filaments awl-shaped, covered by the upper lip; anthers roundish, cleft; germen superior, four-lobed; style thread-shaped, as long as the stamens; stigma divided into two acute, spreading segments;

seeds four, triangular, convex at the top, in the bottom of the stiff, thorny, open calyx.

G. LAD'ANUM, *Red Hemp-nettle*: stem not swelled below the joints; leaves lance-shaped, somewhat serrate, hairy; upper lip of the corolla slightly crenate; stem about a foot high, erect, with opposite branches; flowers in dense whorls; corolla rose-colored, spotted with crimson and white; annual; flowers in August and September; grows among rubbish and in gravelly fields.

G. TETRA'HT, *Common Hemp-nettle*: stem bristly, swelled below the joints; corolla twice as long as the calyx, its upper lip nearly straight; stem from one to two feet high, rough, with deflected, very sharp, prickly bristles; leaves egg-shaped, acute, serrate, hairy on both sides; flowers in numerous dense whorls; corolla with a purple upper lip, and a nearly equally three-lobed lower one, variegated with white and purple; annual; flowers in June and July; grows in cultivated grounds and waste places; common.

GALIUM. Bed-straw. Cleavers. 4—1. Calyx very small, four-toothed, superior; corolla of one petal, wheel-shaped, with four acute divisions; filaments from the base

of the corolla, awl-shaped, shorter than the limb; anthers two-celled; germen inferior, of two united globes; style thread-shaped, cleft, as long as the stamens; stigmas knobbed; seeds two, naked, united, globular, not crowned by the calyx.

*G. VERBUM*, *Common Yellow Bedstraw*: leaves eight in a whorl, linear, channelled, entire at the edges, rough; flowers in dense panicles; root very long, creeping, reddish brown; stems about a foot high, erect, hard, much branched; flowers greenish-yellow, very numerous, in dense panicles. The roots are used in the Hebrides for dyeing a brownish red color: in sandy soil they attain a length of many feet, and are there easily procured, but the digging for them is injurious by setting loose the sand. Perennial; flowers in June and July; grows in pastures, abundantly.

*G. BOREALE*, *Cross-leaved Bedstraw*: leaves four in a whorl, between egg-shaped and lance-shaped, three-nerved, smooth, with rough edges; stems erect; root creeping, reddish; stems a foot high, erect, square, roughish; flowers white, in numerous branched panicles; perennial; flowers in July; grows in shady places.

*G. APARINE*, *Goose-grass*, *Common Cleavers*: leaves eight in a



whorl, lance-shaped, keeled, rough, fringed with reflected prickles; stems feeble; root fibrous; stem branched, from two to six feet long; flowers few, white, in axillar panicles; annual; May to August; grows in moist thickets; common.

GAULTHERIA. 10—1.

*G. PROCUMBENS*, *Partridge Berry*: stem procumbent; leaves in a terminal tuft, oblong, obovate, mucronate, toothed, crowded; flowers axillary, drooping, on downy foot-stalks; outer calyx two-leaved; inner one-leaved, white, five-cleft, the segments roundish, rubacutae; corolla one-petalled, five-cleft; segments reflexed; filaments white, hairy, bent toward the corolla; anthers oblong; germ roundish, depressed, five-angled; style erect; stigma simple; flowers white; May, August; perennial. This humble lit-



the plant may be met with in dry woods, generally near the bottom of large oak trees, forming patches, with small, numerous, beautiful, dark green leaves, among which may be found its bright scarlet berries. The leaves have a pleasant aromatic taste.

GENISTA. 17—4. Calyx inferior, two-lipped, the upper lip with two, the lower with three teeth; corolla of five petals; standard inversely heart-shaped, reflected, standing out from the rest; wings oblong, spreading; keel of two lance-shaped obtuse petals, cohering below; filaments ten, united below into a tube; anthers roundish; stigma oblong; legume compressed, oblong, one-celled, with two concave valves; seeds several, roundish.

G. TINCTORIA, *Wood Waxed, Dyers' Weed*: leaves lance-shaped, smooth; branches round, striated, erect; legumes smooth, nearly cylindrical. A small shrub, with numerous straight branches; flowers on short and axillar stalks, crowded about the tops of the branches; petals bright yellow; a good yellow color is obtained from the whole plant; flowers in July and August; grows in thickets and pastures; very abundant in some places.

GENTIANA. Gentian. 5—2. Calyx inferior, of one leaf, divided into five, sometimes four, oblong, acute, permanent segments; corolla of one petal, tubular in its lower part, the limb deeply divided into five, sometimes four, equal segments; filaments four or five, awl-shaped, shorter than the corolla; anthers oblong; germen oblong, nearly cylindrical, pointed; styles short, erect; stigmas flat, egg-shaped; capsule oblong or elliptical, cylindrical, pointed, slightly cleft, two-valved, one-celled; seeds numerous, small, compressed, attached to the inflected edges of the valves.

G. PNEUMONANTHE, *Marsh Gentian*: corolla bell-shaped, five-cleft; flowers stalked; leaves linear; stems simple, square, from four to ten inches high; leaves sessile, obtuse; flowers large, few on each stem; corolla deep blue, with five prominent pale greenish angles; perennial; flowers in August and September; grows in moist pastures and marshes.

G. SAPONARIA, *Soapwort Gentian*, *Barrel-flowered Gentian*: flowers in whorled heads, sessile; corolla ten-cleft, ventricose, campanulate, closed at top, alternate segments of the corolla fringed, small-

er; leaves opposite, ovate-lanceolate, acuminate, smooth; flowers blue, erect; September, October; height two feet; a handsome, conspicuous plant, growing in moist pastures and by road-sides.

**G. CRINITA**, *Fringed Gentian*: corolla campanulate, four-cleft, segments finely cut; leaves lanceolate, acute; stem round; toward the top the stem divides into several slender branches without leaves, curving at first, then perfectly straight and erect to the top, where each is surmounted by a flower; flowers large, erect; calyx four-cleft; corolla fringed at the margin; flowers purple; July, August; height six to eight inches. This is one of our most beautiful and interesting plants; it generally occurs in cool or moist situations, where it forms a striking and rather lonely contrast with the exhausted herbage around it.

**GERANIUM**. Crane's-bill. 16—5. Calyx inferior, of five egg-shaped, acute, permanent leaves; petals five, inversely heart-shaped, spreading, much larger than the calyx; nectaries five glands, alternate with the petals; filaments ten, awl-shaped, united at the base; anthers oblong; germen roundish, with five furrows; style awl-shaped, erect,

longer than the stamens, permanent; stigmas five, oblong, reflected; capsules five, nearly globular, aggregate, each tipped with a long, linear, erect, pointed, stiff awn, smooth and naked, finally recurved, adhering by its point to the top of the style; seeds one in each capsule, roundish.

**G. ROBERTIA'NUM**, *Stinking Crane's-bill*, *Herb Robert*: leaves ternate



or quinate, with pinnatifid leaflets; calyx angular; hairy; capsules wrinkled, keeled; stems about a foot long, spreading, branched, red, and brittle; flowers purple, sometimes white; annual; flowers from May to October; grows in waste ground, by road-sides, and especially among large stones and the debris of rocks.

**G. MACULATUM**, *Spotted Crane's-bill*: peduncles two-flowered; stem somewhat angular, erect, dichotomous, pubescent; leaves five-parted, cut-toothed, upper ones sessile; root-leaves on very long stalks; peduncles long, hairy; calyx five-leaved; petals rounded; flowers purple; May, June; height two feet; a handsome, showy plant, common about the edges of moist woods; the root is astringent, and a useful medicine.

**G. DISSECTUM**, *Wood Geranium*: leaves deeply divided into five or seven narrow, three-cleft segments; petals cleft; capsules hairy; stems weak, a foot or more high, branched, covered with short, deflected hairs; flowers rather small, with purplish-red petals; annual; flowers in June and July; grows in fields, pastures, and waste ground.

This genus contains many species, some of which are very generally known and cultivated as ornamental plants, while others are mere weeds.

#### GERARDIA. 14—2.

**G. FLA'VA**, *Yellow Gerardia*: pubescent; stem nearly simple; leaves sessile, lanceolate, entire or toothed, and cut; flowers subsessile; stem erect, pubescent; leaves opposite,

few-flowered; flowers large, trumpet-shaped, yellow; August; perennial; height two feet. This beautiful plant is very common in our woods. In drying, it turns black.

**G. GLAUC'A**, *Tall Gerardia*: glabrous stem, panicled; leaves petioled, pinnatifid, pale beneath, the upper ones lanceolate; flowers pedicelled; stem smooth, more branched than *G. fla'va*, which it resembles; flowers yellow; August; perennial.

**G. MARITIMA**, *Salt-Marsh Gerardia*: leaves linear, fleshy; calyx truncate; upper segments of the corolla fringed; stem smooth, with opposite branches; leaves linear-lanceolate, obtuse; peduncles axillary, terminal; flowers purple; July, August; perennial; found on salt marshes.

**G. APHYLLA**: stem naked, nearly simple, with scales opposite, ovate, small, deciduous; corolla longer than the peduncle; stem erect, about three feet high, sparingly branched; flowers small; found along the coast of the southern states.

**G. FLUNKETHI**: stem erect, about two feet high, slightly angled, very much branched; leaves scarce an inch long, setaceous, glabrous; flow-

ers numerous, near the summit of the branches, generally terminal, sometimes opposite and axillary; peduncles about half as long as the leaves; calyx with five minute, acute teeth; flowers small, purple; August to October; grows in wet soils at the south.

**G. SETACEA**: stem slender, much branched, slightly angled, smooth, about two feet high; leaves opposite, about an inch long, with the margins roughish; peduncles opposite and alternate; calyx truncate, teeth subulate, small, acute; flowers small, purple; August—October; annual.

This genus comprises many interesting herbaceous plants peculiar to our continent. It is named in honor of the old English botanist, John Gerarde. They are abundant in our woods, and would find a place in our gardens were they not of very difficult culture. Loudon says "they deserve any pains which may be necessary to their successful cultivation."

**GEUM**. *Avens*. 12—3. Calyx inferior, of one leaf, the limb deeply divided into ten acute segments, of which five alternate ones are much smaller; petals five, rounded, undivided or cleft, as long as the calyx; filaments awl-shaped, shorter than

the corolla; anthers short, roundish, two-celled; germens superior, egg-shaped, compressed, numerous, collected into a round head; styles long, lateral, with a joint above the middle, one to each germen; stigmas simple; seeds egg-shaped, compressed, hairy; receptacle cylindrical, dry, hairy.

**G. RIVALE**, *Water Avens*: root-leaves interruptedly pinnate, some-



what lyrate; styles hairy; root somewhat woody, creeping; stem nearly a foot high, slightly panicled; root-leaves stalked, the terminal lobe very large, rounded, lobed and crenate; stem-leaves ternate or three-lobed; flowers drooping; calyx purplish brown; petals erect, cleft, yellowish brown; the root is astringent and aromatic; perennial; flowers in June and July; grows in moist meadows and woods, and by ditches and streams; cottony; flowers yellow; annual; flowers in August.

**GLECHOMA.** Ground-Ivy. 14  
—1. Calyx of one leaf, tubular, cylindrical, striated, with five pointed, unequal, marginal teeth; corolla gaping; tube slender, compressed; upper lip erect, obtuse, cleft half-way down; lower lip three-lobed, the middle lobe larger and cleft; filaments covered by the upper lip; anthers of each pair coming together, and forming a cross; germen egg-shaped, four-cleft; style thread-shaped, curved under the upper lip; stigma cleft, acute; seeds four, egg-shaped, in the bottom of the permanent calyx.

**G. HEDERA'CEA,** *Ground Ivy, Gill-run-over-the-ground, Alehoof*: leaves



kidney-shaped, crenate; roots creeping, sending out long runners; stems frequently several feet long, creep-

ing; leaves stalked; flowers bluish purple, with a variegated palate. This plant is aromatic, and has been variously used as a medicine. Perennial; flowers in May; grows by old walls and road-sides.

**GLEDITS'CHIA.** 23—2.

**G. TRIACANTHOS,** *Sweet Locust, Honey Locust*: branches spiny; spines thick, triple; leaflets linear-oblong, blunt. The sweet locust belongs peculiarly to the country west of the Alleghanies, and it is scarcely found in any part of the Atlantic states. In situations favorable to its growth, it attains the height of seventy or eighty feet with a diameter of three or four feet, with a trunk undivided for forty feet. This tree is easily known by its bark, which, at intervals of a few inches, detaches itself laterally in plates three or four inches wide and two or three lines thick, and by the form of its trunk, which appears to be twisted, and which presents three or four crevices of inconsiderable depth, opening irregularly from the bottom towards the top. The large thorns which cover the branches, and frequently the trunk of young trees, afford another very distinct character. These thorns are sometimes

several inches long, ligneous, of a reddish color, and armed, at some distance from the base, with two secondary thorns about half the size of the first. The leaves are pinnated, and composed of small, oval, serrate, sessile leaflets. This foliage is elegant and of an agreeable tint; but it is thin, and scarcely obstructs the passage of the sunbeams. It is shed annually at the approach of winter. The flowers, which open in June, are small, not very conspicuous, and disposed in bunches. The fruit is in the form of flat, crooked, pendulous pods, from twelve to eighteen inches long, and of a reddish-brown color. The pods contain hard, smooth, brown seeds, enveloped in a pulpy substance, which, for a month after their maturity, is very sweet, and which then becomes extremely sour.

The perfect wood or heart of the sweet locust nearly resembles that of the water locust, but its grain is coarser, and its pores more open: in these respects it is more strikingly characterized even than the wood of the red oak, when perfectly seasoned. It is little esteemed in Kentucky, where it is more employed, and consequently can be better appreciated, than elsewhere. It is

used neither by the carpenter nor the wheelwright: it is sometimes taken by the farmers for rails to fence their fields, but only when they are unable to procure better wood. The only destination for which it appears to be peculiarly adapted is the forming of hedges, which would be rendered impenetrable by its long thorns. Beer is sometimes made by fermenting the pulp of the fruit while fresh; but the practice is not general, as the apple tree and peach tree, particularly the last, have become common, and afford a much superior beverage.

G. MONOSPERMA, *Water Locust*, *Swamp Locust*: branches somewhat spiny; leaflets ovate-oblong; pods one-seeded. The water locust is first seen in the Atlantic states in the lower part of South Carolina, in which place, as well as in Georgia and East Florida, this tree, though not very rare, is not common. In the western country, it is found three or four degrees farther north in Illinois. It grows to the height of fifty or sixty feet, and from one to two feet in diameter. The bark upon the trunk of young trees is smooth; on old stocks it is cracked, but less deeply furrowed than that

of the oaks and the walnuts. The branches, like those of the sweet locust, are armed with thorns, which are less numerous, smaller and more pointed; they are often simple, or accompanied near the base with a single secondary thorn. The leaves nearly resemble those of the sweet locust, from which they differ in being a little smaller in all their proportions. The flowers, which are not conspicuous, open in June, and are of a greenish color and destitute of odor. These are succeeded by reddish pods about an inch in diameter, and are united in bunches of three, each of which contains a single naked seed. The wood of this tree resembles that of the sweet locust in its loose texture and yellow color; but as it grows in wet grounds, it is consequently inferior in quality.

**GNAPHALIUM.** *Everlasting.* 19—2. Common calyx roundish, imbricated, with membranous colored scales; compound corolla with the florets of the disk perfect, tubular, five-cleft at the margin; some florets destitute of stamens, and often of corolla, either marginal or interspersed in the circumference of the disk; their corolla, when present, slender; filaments five,

hair-like, short; anthers united into a cylindrical tube; germen inversely egg-shaped, angular; style thread-shaped, as long as the floret; stigmas two, spreading, notched; seed inversely egg-shaped, small; down simple or feathery; receptacle naked.

**G. MARGARITACEUM,** *Common Life Everlasting*: leaves between linear and lance-shaped, acutely pointed, alternate, loosely cottony above, densely beneath; stem branched at the upper part; flowers corymbose; stems two feet high, erect, cottony; flowers numerous, with white calyxes; perennial; flowers in August; grows in moist meadows.

**G. ULIGINOSUM,** *Cudweed*: stem much branched, spreading; leaves between lance-shaped and linear, cottony on both sides; flowers in dense terminal clusters, which are shorter than the leaves; stems from five to eight inches high, densely cottony; flowers yellow; annual; flowers in August.

**GORDONIA.** 16—7.

**G. LASIANTRUS,** *Loblolly Bay*: pedicels axillary, half as long as the leaves; leaves oblong, coraceous, smooth, serrated. The loblolly bay is confined to the maritime

parts of the United States, to the Floridas, and to Lower Louisiana. In the pine barrens, tracts of fifty or a hundred acres are met with at intervals, which, being lower than the adjacent ground, are kept constantly moist by the waters collected in them after the great rains. These



spots are entirely covered with the loblolly bay, and are called bay swamps. Although the layer of vegetable mould is only three or four inches thick, and reposes upon a bed of barren sand, the vegetation of these trees is surprisingly luxuriant.

The loblolly bay grows to the height of fifty or sixty feet, with a diameter of eighteen or twenty inches. For twenty-five to thirty feet its trunk is perfectly straight. The small divergency of its branch-

es near the trunk gives it a regularly pyramidal form; but as they ascend they spread more loosely, like those of other trees of the forest. The bark is very smooth while the tree is less than six inches in diameter; on old trees it is thick and deeply furrowed.

The leaves are evergreen, from three to six inches long, alternate, oval-acuminate, slightly toothed, and smooth and shining on the upper surface. The flowers are more than an inch broad, white and sweet-scented; they begin to appear about the middle of July, and bloom in succession during two or three months. This tree possesses the agreeable singularity of bearing flowers when it is only three or four feet high. The fruit is an oval capsule, divided into five compartments, each of which contains small, black, winged seeds. These seeds appear to germinate successfully only in places covered with *sphagnum*, a species of moss which copiously imbibes water.

In trunks of these trees which exceed fifteen inches in diameter, four-fifths of the wood is heart. The wood is of a rosy hue, and of a fine, silky texture; it appears to be very proper for the inside of furni-



ture, though the cypress is generally preferred. It is extremely light; when seasoned it is very brittle, and it rapidly decays unless it is kept perfectly dry: hence it is entirely neglected in use for timber, and it is not employed for fuel. The value of the bark in tanning compensates in some measure for the uselessness of its wood: it is employed for this purpose throughout the maritime parts of the southern states and of the Floridas.

**G. PUBESCENS**, *Franklinia*: flowers subsessile; leaves obovate-lanceolate, downy beneath, subserrate, membranous; petals and sepals silky outside. This species of *gordonia* appears to be restricted by nature within very narrow bounds, having been hitherto found only on the banks of the Altamaha in Georgia. It was discovered there in 1770, by John Bartram, who gave it the name of *Franklinia*, in honor of Dr. Franklin. It flourishes best in a sandy peat.

The *Franklinia* is much smaller than the preceding species, and rarely exceeds thirty feet in height and six or eight inches in diameter. The bark of the trunk presents a smooth and angular surface like that of the hornbeam. The leaves

are alternate, oblong, narrowed at the base and toothed: they are annually shed in autumn. It blooms in Carolina about the beginning of July, and a month later near Philadelphia. The flowers are more than an inch in diameter, white, and of an agreeable odor. Like those of the preceding species, they open in succession during two or three months, and begin to appear when the tree is only three or four feet high. The fruit is in the form of round, ligneous capsules, which, when ripe, open at the summit in four seams, to release the small seeds. No particular use is made of this tree, except for ornament.

### GRASSES.

It has been thought best to depart so far from the alphabetical arrangement, as to introduce the following grasses by themselves.

**AGROSTIS**. Bent-grass. 3—2. Calyx of two unequal, acute, keeled, awnless, permanent chaff-scales, containing one flower; corolla of two unequal, membranous, ribbed husks, tufted with hairs at the base, the larger frequently bearing an awn; nectaries two minute scales; filaments hair-like, rather longer than the husks; anthers deeply divided at each end; germen egg-

shaped; styles short; stigma densely hairy; seed egg-shaped, shining, loose, enveloped in the unaltered corolla.

A. AL'IA, *Marsh Bent-grass*: panicle spreading, with rough branches; chaff-scales lance-shaped, bristly on the keel; straw oblique, creeping in its lower part; stipules oblong; root and stems creeping, and sending out long prostrate shoots; panicle at length spreading, with tufted branches, and green or purple flowers; perennial; flowers in June and July; grows in moist meadows and places inundated in winter, and on the other hand frequently in dry sand, exhibiting great diversity of appearance. Wild geese and ducks are fond of its juicy stems and roots, which have a sweet taste.

C. CAN'NA, *Brown Bent-grass*: awn arising from below the middle of the husk, curved inward, twice the length of the husk; stems decumbent, with prostrate shoots; stipules lance-shaped; root creeping; straws more or less decumbent and rooting at the base, about two feet long, slender, smooth; leaves roughish on both sides; panicle spreading when in flower, with thread-like, angular, rough branches; perennial; flowers in June and July; grows

in meadows and pastures; common.

A. SPI'CA-VEN'TI, *Silky Bent-grass*: awn straight, stiff, many times longer than the corolla; panicle loosely spreading; stem two or three feet high, erect, smooth; leaves ribbed, spreading; panicle large, silky-looking; outer husk rough with tubercles, inner cleft at the point; annual; flowers in June and July; grows in sandy fields.

A. VULGA'RIS, *Fine Bent-grass*: panicle spreading, with smooth, divaricated, hair-like branches; chaff-scales nearly equal; straw erect; stipules very short, abrupt; root creeping; straws about a foot high; panicle smooth, with purplish flowers; perennial; flowers in July and August; grows in mowing grounds and pastures.

AI'RA. Hair-grass. 3—2. Calyx of two unequal, keeled chaff-scales, containing two perfect flowers, without rudiments of a third; corolla of two oblong, unequal husks, the outer larger, generally with a twisted awn arising from above the base, the inner notched and awnless; nectary a cleft scale; filaments hair-like; anthers protruded, pendulous, notched at both ends; germen egg-shaped; styles short, distinct;

stigma large, feathery; seed egg-shaped, loose, covered with membranous husks.

**A. AQUATIGA**, *Water Hair-grass*: panicle spreading; flowers awnless, even, obtuse, longer than the calyx; leaves flat; stipule oblong; root creeping; stems floating, branched, smooth, rising about a foot above the water; panicle erect, with spreading branches; perennial; June; grows in ditches, pools, and the edges of rivers, at the south.

**A. OCEAFITOSA**, *Turfy Hair-grass*: flowers about the length of the calyx, abrupt, hairy at the base; awn short, from the base of the outer husk; leaves flat; straws from two to four feet high, erect, smooth, growing in large tufts; panicle large, much branched, with small silvery purplish flowers; perennial; flowers in June and July; grows in moist, shady places.

**A. FLEXUOSA**: panicle spreading, with waved branches; flowers acute, as long as the calyx; awn from the middle of the outer husk, twisted; leaves bristle-shaped; straw upwards of a foot high, erect, smooth; leaves short; panicle erect, with waved, angular branches and flower-stalks, and shining brown flowers; perennial; flowers in July.

**ALOPECURUS**. Fox-tail-grass.  
3—2. Calyx one-flowered, of two, nearly equal, egg-shaped, ribbed chaff-scales; corolla of one, concave, egg-shaped husk; awn twice as long as the husk, and arising from its base; filaments hair-like; anthers forked at each end; germs roundish; styles hair-like, united at the base; stigmas long, feathery; seed egg-shaped, loose, covered by the husk.

**A. PRATEN'SIS**, *Meadow Fox-tail-grass*: straw erect, smooth; panicle spiked, cylindrical; chaff-scales acute, hairy, shorter than the awn of the husk; root fibrous; straws about two feet high; leaves flat, nearly smooth; spiked panicle about two inches long, hoary; perennial; flowers in May; grows in meadows and pastures.

**A. GENICULATUS**, *Floating Fox-tail-grass*: straw ascending, bent at the joint; panicle spiked, cylindrical; chaff-scales united at the base, abrupt, fringed; root fibrous; straw decumbent at the base; spikes an inch and a half long; chaff-scales obtuse, purple, strongly fringed on the keel; husk abrupt, shorter than the calyx; awn twice the length of the calyx; perennial; flowers in June and July; grows in

ditches and watery places; common.

**ANTHOXANTHUM.** 2—3. Calyx of two egg-shaped, pointed, concave chaff-scales, one-flowered; corolla of two equal husks, shorter than the calyx, awned on the back; an internal corolla, or nectary, consisting of two egg-shaped, minute scales; stamens hair-shaped, longer than the corolla; anther oblong, forked at both ends; germen superior, oblong; styles short; stigmas long, downy; seed one, nearly cylindrical, tapering at each end.

**A. ODORATA**, *Sweet-scented Spring-grass*: panicle spiked, oblong; flowers on short stalks, and longer than the awns; about a foot high; leaves short, pale green; panicle dense, becoming brownish yellow; scales of the calyx unequal, acute, membranous, with a green bristly keel; husks of the corolla obtuse, hairy, shorter than the calyx, one with a short straight awn, the other with a longer twisted one; internal corolla or nectary of two very small, membranous scales. This grass when drying is very fragrant. Introduced from Europe.

**BRIZA**. Quaking-grass. 3—2. Calyx of two nearly equal, inversely egg-shaped, slightly keeled, awnless

chaff-scales, containing a broadly egg-shaped, obtuse, compressed spikelet of many two-rowed, imbricated, perfect flowers; corolla of two unequal, obtuse, awnless husks, the outer nearly orbicular, concave, contracted at the edges; the inner much smaller, inversely egg-shaped, inflected at the edges; nectary a cleft scale; filaments hair-like, longer than the corolla; anthers oblong, pendulous; germen egg-shaped; styles very short; stigmas feathery, long; seed nearly orbicular, flat, closely invested by the husks.

**B. ME'DIA**, *Common Quaking-grass*: spikelets broadly egg-shaped, seven-flowered; calyx shorter than the flowers; straw about a foot high; leaves deep green; panicle with very slender branches, and large purplish, tremulous spikelets; inner husk finely fringed, entire at the end. A very beautiful grass, but of little value to pasturage. Perennial; flowers in June and July; grows in dry pastures.

**BROMUS**. Brome-grass. 3—2. Calyx of two unequal, egg-shaped or lance-shaped, acute, compressed, awnless chaff-scales, containing an egg-shaped or oblong, compressed, imbricated spikelet of numerous, two-rowed, awned, perfect flowers;

corolla of two unequal husks, the outer elliptical, ribbed, longer than the calyx, cleft at the top, awned on the back just below the summit, with a tapering awn, generally as long as the husk; inner husk nearly as long as the outer, but much narrower, two-ribbed, with membranous inflected margins, and a fringe on the ribs. Nectary a deeply divided scale, or two distinct undivided ones; filaments hair-like, shorter than the corolla; anthers short, pendulous, notched at both ends; germen egg-shaped; styles distant, lateral; stigmas densely feathered; seed oblong, depressed, downy at the summit, united to the inner husk.

**B. SECALINUS**, *Smooth Rye Brome-grass*: panicle spreading, little branched; spikelets egg-shaped, of about ten, distinct, sub-cylindrical, smooth flowers; awns waved, shorter than the husks; leaves slightly hairy; straws from two to three feet high; lower branches of the panicle whorled and slightly subdivided, upper simple; annual; flowers in July and August; grows in fields.

**B. MOLLIS**, *Soft Brome-grass*: panicle erect, close, compound; spikelets egg-shaped, slightly compressed, downy; flowers imbricated,

depressed, ribbed; awns as long as the husks; leaves and sheaths very soft and downy; from one to two feet high; spikelets of from five to ten flowers; biennial; flowers in June and July; grows in fields, pastures, and by way-sides; abundant. A coarse grass, little relished by cattle.

#### CYNODON. 3—2.

Calyx of two nearly equal, lance-shaped, acute, keeled, awnless scales, containing a single flower; corolla of two unequal, keeled, compressed, awnless husks, the outer much broader and embracing the other; nectary of two minute scales; filaments rather longer than the husks; anthers cleft at both ends; germen egg-shaped; styles distinct; stigma feathery; seed egg-shaped, invested by the hardened husks.

**C. DACTYLON**, *Dog's-tooth-grass*: spikes four or five, crowded; husks smooth; root creeping, rough; straws creeping, round, smooth; leaves tapering, hairy, with long, smooth sheaths; flowering branches about six inches high, each bearing four or five linear spikes; perennial; flowers in July and August.

**DACTYLIS**. 3—2. Calyx of two unequal, narrow lance-shaped, keeled, compressed, long-pointed

chaff-scales, containing a spikelet of several flowers; corolla of two unequal lance-shaped, keeled, compressed husks, the outer more or less awned, flat and membranous at the edges, the inner narrower, two-ribbed, folded acutely, cleft at the end; nectary of two lance-shaped, pointed scales; filaments hair-like, longer than the corolla; anthers cleft at both ends; germen roundish; styles very short, distinct; stigmas feathery, spreading; seeds oblong, loose, covered by the unaltered husks.

*D. GLOMERATA*, *Cock's-foot-grass*: panicle distinctly branched, unilateral; flowers in dense tufts; corolla somewhat awned, five-ribbed, taper-pointed; straw erect, about two feet high; leaves linear, flat, dark green, striated, harsh. A coarse grass, little relished by cattle, but said to improve greatly by culture. Perennial; flowers in June and July; grows by walls and roads.

*DIGITARIA*. 3—2. Calyx one-flowered, of three very unequal, awnless scales, the outer minute, triangular, the next largest as long as the corolla, the inner opposite to the latter, small, lance-shaped; corolla of two unequal, elliptical, awnless valves; filaments hair-like, rather longer than the husks; an-

thers short, cleft at both ends; germen egg-shaped; styles thread-shaped, about the length of the stamens; stigmas short, feathery; seed egg-shaped, closely invested by the hardened polished husks.

*D. SANGUINALIS*, *Cock's-foot Finger-grass*: leaves and their sheaths somewhat hairy; flowers in pairs; calyx rough at the edges of its larger scale only; root fibrous; stems decumbent and rooting at the base, about a foot long, striated, smooth; leaves broad, pointed, striated, sprinkled with warts; spikes from three to eight, crowded at the top of the straw; flowers dark purple, erect; larger chaff-scale five-ribbed, with rough edges; annual; flowers in July and August.

*ERIOPHORUM*. 3—2. Calyx a flat membranous chaff-scale; corolla none; spike imbricated all round; filaments hair-like; anthers linear, protruded, pendulous; germen inversely egg-shaped; style thread-shaped; stigmas three, longer than the style, reflected; seed three-cornered, tapering to a point, furnished at the base with very long, soft, silky hairs.

*E. ALPINUM*, *Alpine Cotton-grass*: straw triangular; leaflets above the base, which is sheathed; upper

sheaths terminating in very short, linear leaves; spike lance-shaped; root creeping, scaly; straws eight inches high, about five, erect, striated, destitute of joints; leaves few, channelled, shorter than their sheaths; spike small, consisting of a few reddish scales with a green keel; hairs few and tortuous; perennial; flowers in June and July.

*E. VAGINATUM, Hare's-tail Cotton-grass:* straw triangular above, round below; uppermost sheath inflated; spike egg-shaped; root creeping; straws jointed, smooth, about a foot high; leaves channelled, sheathing; spike large, egg-shaped, pointed, blackish, with membranous scales; hairs numerous, long, white and shining; perennial; flowers in March and April; grows in boggy places.

*FESTUCA. 3—2.* Calyx of two very unequal, lance-shaped, pointed chaff-scales, containing an oblong, compressed, imbricated spikelet, of many two-rowed, more or less awned, perfect flowers; corolla of two unequal husks, the outer commonly nearly cylindrical, entire, pointed or awned, keeled, more or less ribbed, a little inflexed at the edges; the inner more narrow, elliptical, two-ribbed, cleft or abrupt, with membranous margins, folded in at the

rib; nectary of one deeply divided, or of two separate acute scales; filaments hair-like, shorter than the husks; anther linear, pendulous, notched at both ends; germen round; styles short, distant; stigmas feathery; seed: oblong, acute, loose, enveloped in the unaltered husks.

*F. DURIUSCULA, Hard Fescue:* panicle unilateral, spreading; spikelets oblong, of about six flowers with short awns; stem-leaves nearly flat; root-leaves involute, bristle-shaped; straws from one to two feet high; leaves roughish on the keel and edges; perennial; flowers in June and July; grows in pastures and waste ground; common.

*F. RUBRA, Creeping Fescue:* panicle unilateral, spreading; spikelets oblong, of about six flowers with short awns; leaves downy above, more or less involute; root extensively creeping. The long, creeping root furnishes the principal distinctive character of this species. Perennial; flowers in June and July; grows in dry pastures.

*F. BROMOIDES, Barren Fescue:* panicle unilateral, nearly erect, simple; spikelets oblong, smooth; flowers shorter than their awns; leaves tapering, shorter than their sheath;

straws from four to ten inches high; panicle of a few long-stalked spikelets; outer chaff-scale extremely narrow, acute; annual; flowers in June; grows on walls and sandy ground.

*F. MYRŌRUS, Wall Fescue*: panicle drooping, elongated, rather close; flowers tapering, shorter than their awns, rough at the top; leaves awl-shaped; about sixteen inches high, with a panicle five or six inches long; annual; flowers in June and July; grows on walls and dry sandy ground.

*F. FRATENSIS, Meadow Fescue*: panicle nearly erect, branched, spreading, inclined to one side; spikelets lance-shaped, compressed, with eight or nine cylindrical flowers; root fibrous; straws about two feet high, round, smooth; leaves linear, pointed, striated, rough at the edges; panicle with compressed, rough stalks; nectary four-cleft; perennial; flowers in June and July; grows in moist pastures and by road-sides.

*F. ELA'TIOR, Tall Fescue*: panicle somewhat drooping, much branched, spreading in all directions; spikelets between egg-shaped and lance-shaped, with numerous cylindrical, somewhat awned flowers; root creeping; straws about four feet high, striated,

smooth; leaves narrow lance-shaped, smooth, rough at the edges; nectary four-cleft; perennial; flowers in June and July; grows in moist meadows; not common.

**GLYCERIA. 3—2.** Calyx of two unequal, awnless chaff-scales, containing a linear spikelet of numerous, alternate, two-rowed, awnless flowers, unconnected by a web at the base; corolla of two unequal husks, the outer cylindrical, ribbed, entire, more or less abrupt, with inflected edges; the inner narrower, obtuse or notched, flat, membranous, with two marginal ribs; nectary a notched scale; filaments hair-like, longer than the corolla; anthers pendulous, linear, cleft at both ends; germen egg-shaped; styles distinct; stigmas spreading, feathery, repeatedly branched; seed oblong, loose, covered with the unaltered husks.

*G. FLU'TANS, Floating Sweet-grass*: panicle slender, very long, slightly branched; spikelets with numerous obtuse, seven-ribbed, cylindrical flowers; root creeping, long; straws partly floating, as are many of the linear, flat, obtuse leaves; panicle nearly erect, narrow, with roughish branches; spikelets erect, long, linear, of from eight to twelve flowers; outer husk cylin-



dricul, obtuse; perennial; flowers in June and July; grows in ditches and stagnant waters.

**HOL'CUS.** 23—1. Calyx two-flowered, of two unequal, keeled, awnless chaff-scales, one of the flowers perfect, the other with an abortive germen; corolla of two equal husks, the larger egg-shaped, keeled, awned on the back, the smaller much narrower, awnless; nectary a cleft scale; filaments three in both flowers; anthers notched at both ends; styles short, spreading; stigma large, feathery; seed coated with the hardened permanent husks.

**H. LANA'TUS,** *Meadow Soft-grass*: perfect flower inferior, awnless; imperfect flower with a curved awn included in the calyx; root fibrous; straw about two feet high; the whole plant, particularly the leaves, covered with a very soft short down; chaff-scales nearly equal, downy; flowers shining, the upper with a tuft of hairs at the base; perennial; flowers in July; grows in meadows, pastures, woods, and by roads.

**HOR'DEUM.** 3—2. Common receptacle elongated, jointed, toothed alternately on each side, the intermediate spaces flattened and bordered; flowers three at each tooth,

not all perfect; calyx to each flower of two pointed or awned, parallel, erect chaff-scales; corolla of two husks, the outer egg-shaped, angular, terminated by a long, straight, rough awn; the inner smaller, lance-shaped, flat, pointed, inflected at the edges; nectary of two acute scales; filaments hair-like, short; anthers notched at both ends; germen turbinate; styles very short; stigmas feathery, reflected; seed oblong, pointed at both ends, channelled on the upper side, firmly united to the husks.

**H. JUBA'TUM,** *Squirrel-tail-grass*: beards and involucre very long; stems slender, smooth, round, one or two feet high; leaves rough on the back and edge; flowers in June. This grass makes a beautiful appearance among the tall grasses of our marshes.—Barley belongs to this genus.

**LO'LIIUM.** 3—2. Common receptacle elongated, alternately channelled or excavated to receive the spikelets; calyx many-flowered, of one lance-shaped permanent chaff-scale; corolla of two unequal husks, opposite to the calyx, the outer lance-shaped, somewhat keeled, acute, cleft at the point, the keel terminated by an awn; the inner ellipti-

cal, smaller, with the edges inflected; nectary of two egg-shaped scales; filaments hair-like, shorter than the corolla; anthers oblong, cleft at each end; germen obtuse; styles very short; stigmas feathery; seed oblong, convex on one side, flat and furrowed on the other.

**L. PERENNE**, *Common Rye Grass*, *Red Darnel*: corolla very slightly awned; spikelets longer than the calyx; flowers lance-shaped; root fibrous; stems several, about a foot high, round, smooth, stiff, with purplish tumid joints; leaves linear, pointed, smooth, striated; spike erect, purplish. This plant is subject to considerable variation, as it grows in rich or poor soil, being from six inches high to nearly three feet, and having the spike with few spikelets, or with a great number closely crowded together. It is well known to farmers, being extensively cultivated. Perennial; flowers in June and July; grows in meadows and pastures, and by road-sides.

**L. TEMULENTUM**, *Bearded Darnel*: corolla with a long awn; spikelets shorter than the calyx; flowers elliptical; straw rough; straws two or three feet high, round, rough at the upper part; leaves rough on the

upper side; spike from four to six inches long, with a rough stalk; annual; flowers in July; grows in fields among wheat or barley.

**MILTUM**. 3—2. Calyx one-flowered, of two unequal, egg-shaped, tapering, awnless chaff-scales; corolla of two unequal, egg-shaped husks, inclosed within the calyx, the outermost sometimes awned on the back; nectaries membranous, cleft; filaments hair-like, very short; germen egg-shaped; styles united, or very short; seed egg-shaped, covered with the hardened husks.

**M. EFFUSUM**, *Spreading Millet-grass*: flowers awnless, in a loose, spreading panicle; root fibrous; straws about four feet high, slender, smooth; leaves broad, flat, bright green; panicle large, widely spreading; perennial; flowers in June and July; grows in moist shady places.

**PHALARIS**. 3—2. Calyx one-flowered, of two nearly equal, keeled, compressed, acute chaff-scales; corolla double, concealed by the calyx, of three or four husks, the two inner larger, downy; nectaries two equal, egg-shaped scales; filaments thread-like; anthers oblong; styles short, with feathery stigmas; seed egg-shaped, invested by the hardened internal husks.

**P. CANARIENSIS**, *Canary Grass*: panicle egg-shaped, close; chaff-scales keeled, hairy; outer corolla of two bare husks; about eighteen inches high; straw erect, striated, roughish; leaves lance-shaped, soft; panicle erect, compound, resembling an egg-shaped spike, beautifully variegated with green and white. This is a foreign species, the seeds of which, accidentally dropped, sometimes spring up in waste places and upon dunchills. Annual; flowers in July.

**P. ABUNDINACEA**, *Reed Canary Grass*: panicle erect, loose; outer husks bearded; roots creeping, sending out large fibres; straws from three to five feet high; leaves lance-shaped, striated, smooth; panicle about six inches long, tinged with purple; chaff-scales acute, keeled, with a nerve on each side, rough on the keel and nerves; outer husks minute, each terminated by a tuft of hairs; perennial; flowers in July; grows on the edges of rivers.

**PHLEUM**. 3—2. Calyx one-flowered, of two nearly equal, compressed, pointed or awned chaff-scales; corolla of two concealed, unequal husks, the outer embracing the inner; filaments hair-like; anthers linear, protruded; germen

roundish; styles thread-like, spreading; stigmas feathery; seed oblong, loose.

**P. FRATENSE**, *Common Cat's-tail-grass*, *Timothy Grass*: panicle spiked, cylindrical; chaff-scales abrupt, fringed on the keel, longer than the awn; root fibrous; straws from two to three feet high, knotty, erect; leaves linear, flat, rough, with long sheaths; panicle erect, very close, spiked, of a cylindrical form, from two to four inches long, green; the roots are sometimes bulbous; perennial; flowers in the summer months.

**P. ALPNUM**, *Alpine Cat's-tail-grass*: panicle spiked, between egg-shaped and oblong; chaff-scales abrupt, fringed on the keel, as long as the awns; root knotted; straw ascending, from six to twelve inches long, smooth; spiked panicle about an inch in length; perennial.

**POA**. 3—2. Calyx of two unequal, egg-shaped, acute, keeled, awnless chaff-scales, containing an egg-shaped spikelet of two-rowed, imbricated, awnless, perfect flowers, frequently connected at the base by a web of white cottony filaments; corolla of two unequal husks, the outer egg-shaped, acute, keeled, compressed, entire, membranous at the edges; the inner narrower, with

two nearly marginal ribs, inflected membranous edges, and a cleft summit; nectary a deeply-cleft scale; filaments hair-like, longer than the corolla; anthers pendulous, oblong, cleft at both ends; germen egg-shaped; styles very short; stigmas feathery, spreading; seed oblong, acute, loose, covered with the unaltered husks.

*P. COMPRESSA*, *Flat-stalked Meadow-grass*: panicle somewhat unilateral, spreading; straw compressed; spikelets oblong; flowers connected by a web; root creeping; straw decumbent at the base, about a foot high; panicle with rough angular branches; spikelets from three to eight flowers; outer husk five-ribbed, rough on the keel; perennial; flowers in June, July and August; grows in waste ground.

*P. TRIVIALIS*, *Roughish Meadow-grass*: panicle spreading; spikelets oblong, of about three acute, five-ribbed flowers, connected by a web; straw and sheaths roughish; root fibrous; from one to two feet high; leaves linear, acute; panicle large, with half-whorled, rough branches, and green flowers. A valuable grass for pasturage and hay. Perennial; flowers in June and July; grows in meadows and pastures.

*P. PRATEN'SIS*, *Smooth Meadow-grass*: panicle spreading; spikelets oblong, of about four acute, five-ribbed flowers, connected by a web; straw and sheaths smooth; root creeping; about a foot high; leaves linear, acute; panicle with half-whorled, smooth branches, and pale green flowers. One of the most valuable pasture plants. Perennial; flowers in June and July; grows in meadows and pastures.

*P. AN'NUA*, *Annual Meadow-grass*: panicle somewhat unilateral, with spreading or deflected branches; spikelets egg-shaped, of about five somewhat distant, five-ribbed flowers, destitute of a web; straw ascending, a little compressed; root fibrous; straws about six inches long, decumbent and rooting at the base; panicle pale green; the whole plant tender, and rather succulent; annual.

*P. MEMORABILIS*, *Wood Meadow-grass*: panicle spreading, with hair-like branches; spikelets lance-shaped, of about three five-ribbed, acute flowers, silky on the keel and lateral ribs, and hairy at the base, without a web; the whole plant slender and delicate; straws erect, about two feet high; leaves linear, flat, tapering to a fine point, roughish; pani-

cle erect; perennial; flowers in June and July; grows in woods.

**GYMNOCLADUS. 22—8.**

G. CANADENSIS, *Canadian Gymnocladus*, *Coffee Tree*: leaves bipinnate, very large, deciduous; flowers equal, dioecious. Upper Canada beyond Montreal, and that part of Genesee which borders on Lake Ontario and Lake Erie, are the most northern countries which produce the coffee tree; but it is much less abundant in these climates than in Kentucky and Tennessee, and in the tracts which border on the Ohio and Illinois rivers. It usually grows to the height of fifty or sixty feet, with a diameter of twelve or fifteen inches. In summer, this tree when fully grown has a fine appearance: its straight trunk is often destitute of branches for thirty feet, and supports a summit not very widely spread, but of a regular shape and tufted foliage: in the winter, when its leaves are fallen, the fewness of its branches, and the size of the terminal ones, which are very large in comparison with those of other trees, give it a peculiar appearance, somewhat resembling a dead tree. This is probably the reason of its being called *Chicot*, stump tree, by the French Canadians. To this pecu-

liar character is added another of the epidermis, which is extremely rough, and which detaches itself in small, hard, transverse strips, rolled backward at the ends, and projecting sufficiently to render the tree distinguishable at the first sight. The leaves are three feet long and twenty inches wide on young and thriving trees; on old ones they are not more than half as large. These leaves are doubly compound, with oval-acuminate leaflets from one to two inches long, which are of a dull green, and in autumn the petiole is of a violet color. The barren and fertile flowers are borne on different trees. The flowers open from May to July, and are white and large. The fruit consists of large bowed pods, of a reddish-brown color, and of a pulpy consistency within. They contain several large, gray seeds, which are extremely hard.

The wood of the coffee tree is very compact, and of a rosy hue. The fineness of its grain renders it fit for cabinet making, and its strength proper for building. Like the locust, it has a valuable property of rapidly converting its sap into perfect wood, so that a trunk six inches in diameter has only six

lines of sap, and may be employed almost entire. The live bark is very better, so that a morsel no bigger than a grain of maize chewed for some time produces a violent irritation of the throat.

## H.

**HAMAME'LIS.** Witch Hazel.  
4—3.

**H. VIRGINICA,** *Witch Hazel*: leaves obovate, acutely toothed, cordate



with a small sinus; flowers sessile; corolla yellow; petals four, long, irregularly twisted or curled; October—December. This beautiful and interesting shrub is common in moist woods and thickets. When on the approach of winter our forest trees, stripped of their summer foliage, display only a mass of brownish naked twigs, the witch hazel, in defiance of chilling frosts and snows, puts out its singular and beautiful blossoms, in striking con-

trast with the death-ish sleepiness and desolation which has settled over all our woods and fields. The small branches were once used for *divining* or *mineral rods*, which accounts for its name of witch hazel.

**HELIAN'THUS.** Sun-flower.  
19.—2.

**H. DIVARICA'TUS,** *Wild Sun-flower*: stem erect, round, smooth, much branched; leaves opposite, sessile, lanceolate, three-nerved, very rough; panicle trichotomous, slender, few-flowered; florets yellow; August—September; perennial. This is a large, showy plant, common in our woods and thickets. It is much improved by cultivation, both in its size and the number of its flowers.

There are many species of sun-flower indigenous to the United States. *H. giganteus* grows in the mountains of Carolina to the height of more than ten feet. The fine large cultivated plant of our gardens is the *H. annuus*, from South America. The common Jerusalem artichoke, cultivated for its tuberous roots, belongs to this genus, and was brought from Brazil. *Helianthus* is derived from two Greek words, signifying sun and flower. Any one who looks at the flower will find no fault with the name.

## HEPATICA. 13—4.

H. TRILÓBA, *Early Anemone*: leaves cordate, three-lobed; lobes entire; scape one-flowered. A pretty little plant three or four inches high, common in our woods. It may be known by its beautiful evergreen, smooth leaves, the three lobes of which have been compared to the three lobes of the liver. It flowers in April.

HERA'CLEUM. Cow Parsnep. 5—2. Inner flowers barren; those of the circumference perfect and fertile; calyx superior, of five small, acute teeth; petals five, inversely heart-shaped, with one inflected point; in the innermost flowers smallest and nearly equal; in the outer much larger, irregular, the outer one largest, and the two inner smallest; filaments thread-shaped, longer than the corolla, spreading, a little incurved; anthers roundish; germen egg-shaped, slightly compressed transversely; styles at first erect, rather short, afterwards flattened, spreading, broad and pyramidal at the base; stigmas obtuse, notched; floral receptacle undulated, crenate, a little broader than the base of the styles; fruit inversely heart-shaped, nearly flat, crowned with the floral receptacle and styles;

seeds inversely heart-shaped, deeply notched at the top, and more or less so at the base, with five ribs; four intermediate colored lines in the interstices; the border narrow, flat; juncture close, flat, nearly as broad as the seeds.

H. LANA'TUM, *Cow Parsnep, Hogweed*: leaves pinnate; leaflets pinatifid, cut, and serrate; stem about four feet high, branched, furrowed, rough, with spreading hairs. Flowers in June, July. One of our largest umbelliferous plants. Grows about moist cultivated grounds.

## HIBISCUS. 16—7.

H. PALUS'TRIS, *Marsh Hibiscus*: stem herbaceous, simple, erect, four or five feet high; leaves ovate, toothed, somewhat three-lobed, hoary, with down beneath; peduncles long, axillary, or petioled. Flowers large, showy, pale purple; August; perennial. A large showy plant, found on the borders of some of our rivers. Its fibrous bark is said to be as strong as that of the hemp.

HIERA'CIIUM. Hawkweed. 19—1. Common calyx egg-shaped, imbricated, of numerous linear, very unequal scales; compound corolla of numerous, imbricated, uniform, perfect, strap-shaped, abrupt, five-

toothed florets; filaments hair-like, very short; anthers united into a cylindrical tube, much shorter than the floret; germen nearly egg-shaped; style thread-shaped, as long as the stamens; stigmas two, reflected; seed egg-shaped or oblong, angular; seed-down sessile, hair-like, uniform; receptacle convex, naked or nearly so, dotted.

*H. VENO'SUM*, *Veiny-leaved Hawkweed*: scape naked, branching; calyx smooth; leaves obovate, somewhat acute, entire, ciliate, veins colored; leaves radical, spreading; flower-stalk slender, erect, smooth, of a dark brown color, about two feet high; panicles on very slender stalks. Flowers yellow; June, July; perennial.

*H. KAL'MII*, *Kalm's Hawkweed*: stem erect, many-flowered; leaves lanceolate, toothed; peduncles downy; stem rather tall, terminating in a peduncle of erect flowers, with axillary, downy foot-stalks; leaves alternate, subsessile, acuminate, serrate, the serratures diverging. Flowers yellow; August; perennial; grows about cultivated grounds; height twelve inches.

*H. PANICULATUM*, *Panicked Hawkweed*: leaves alternate, sessile, lanceolate, naked, toothed, pale be-

neath; stem slender, erect, leafy, about a foot high, terminated by a panicle with long apillary branches and numerous, small, yellow flowers; August; perennial; grows in thick woods.

*HIPPURIS*. *Mare's-tail*. 1—1. Calyx reduced to a mere border, crowning the germen; corolla none; filament superior, longer than the calyx; anther two-lobed, compressed; style awl-shaped; stigma simple, acute; seed oval, naked.

*H. VULGARIS*, *Mare's-tail*: leaves linear, in whorls; from one to two



feet high; root creeping; stem erect, simple, jointed; leaves linear, smooth, acute, arranged in numerous whorls, each containing about twelve; flowers axillary, solitary, sessile; germen egg-shaped; anther very large, red. Perennial; flowers



in May and June; grows in pools and marshes.

HOPEA. 18—2.

H. TINCTORIA, *Sweet Leaf*. The sweet leaf is common in Virginia, West Tennessee, and in the upper part of the Carolinas and of Georgia; but it is still more abundant within the limits of the *pine-barrens*, where the soil is light and the winter less rigorous than at a greater distance from the ocean.

This tree varies in size according to the situation in which it grows; on the banks of the Savannah and on the borders of the large swamps, where the soil is deep, loose and fertile, it grows from twenty-five to thirty feet in height, and from seven to eight inches in diameter at the height of five feet from the ground. Commonly it does not exceed half these dimensions, and in the *pine-barrens*, where it is profusely multiplied, it is sometimes only three or four feet in height. The sprouts from the trunks consumed in the annual conflagration of the forests never surpass this height, and, as they do not fructify, the tree is multiplied by its running roots, which shoot at the distance of a few feet. The trunk is clad in a smooth bark, and, if wounded in the spring,

it distils a milky fluid of an unpleasant odor. The leaves are three or four inches long, smooth, totally thick, alternate, of an elongated oval shape, slightly denticulated, and of a sugary taste. In sheltered situations they persist during two or three years, but in the *pine-barrens* they turn yellow with the first frost and fall towards the first of February. The flowers spring from the base of the leaves, and appear early in the season; they are yellowish, sweet-scented, and composed of a great number of stamens, shorter than the petals, and united in separate groups at the base. The fruit is cylindrical, minute, and of a deep blue color at its maturity.

The wood of this tree is very soft and is totally useless. The foliage is the only part which is of any utility; when dry it affords, by decoction, a beautiful yellow color, which is rendered permanent by the addition of a little alum, and is used to dye wool and cotton. But if these leaves had possessed any considerable value they would doubtless have found their way into commerce.

HOTTONIA. Water Violet.  
5—1. Calyx inferior, of one leaf, deeply divided into five linear seg-

ments; corolla of one petal, salver-shaped, with a cylindrical, open tube, the limb divided into five oblong, notched, equal segments; filaments awl-shaped, short; anthers oblong; germen globular, pointed; style short, cylindrical; stigma globular; capsule globular, pointed, one-celled, five-valved; seeds numerous, roundish.

*H. PALUSTRIS*, *Water Featherfoil*, *Water Violet*: stalks solitary, many-flowered; partial stalks whorled; foliage under water, the flowers alone rising above the surface; leaves deeply pinnatifid, with linear segments; flowers in numerous whorls, lilac-colored, of the shape of those of the primrose; flowers in June; perennial. A very curious plant, found in ditches and sluggish streams.

*HUMULUS*. Hop. 22—5. Barren flowers: calyx of five oblong, concave leaves; corolla none; filaments five, hair-like, very short; anthers oblong, two-celled, with two terminal pores.

Fertile flowers: catkin of numerous, large, membranous, imbricated scales; calyx an oblique undivided scale; corolla none; germen superior, minute, oblong; styles two,

awl-shaped, spreading, downy; stigmas simple; seed one.

*H. LUPULUS*, *Common Hop*; stems herbaceous, twining, branched, angular, rough; leaves opposite, stalked, heart-shaped, serrate, veined, rough; flowers pale green. The properties of the cones are well known. Perennial; flowers in July; grows in thickets in all parts of the United States. In some parts of New England, it is extensively cultivated.

#### HYDROPELTIS. 13—4.

*H. PURPUREA*. A curious aquatic plant, known at once by its handsome, elliptical leaves, which may generally be found floating among those of the water lily. Leaf-stalk inserted in the centre of the leaf; root fibrous. The whole plant, excepting the upper surface of the leaf, which is smooth and shining, is covered with a viscid slime. Flowers purple; July; perennial.

*HYOSCYAMUS*. Henbane. 5—1. Calyx inferior, of one leaf, tubular, swelling below, the limb divided into five segments; corolla of one petal, funnel-shaped, irregular; tube cylindrical, short; limb divided half-way into five obtuse, rounded segments, one of them broader;

filaments awl-shaped, somewhat unequal in length; anthers heart-shaped; germen roundish; style thread-shaped, reclined, as long as the stamens; stigma knobbed; capsule egg-shaped, with a longitudinal furrow at each side, two-celled, opening transversely; seeds numerous, inversely egg-shaped, curved, covering the oblong, convex receptacles, which are attached to the partition.

**H. NIGER**, *Common Henbane*: leaves sinuated, embracing the stem; flowers sessile; stem branched, rounded; the whole plant woolly and clammy, with a fetid odor; flowers pale yellowish, with dark purple veins; poisonous, producing convulsions, delirium and death; used medicinally as a sedative; July; grows in waste ground, in loose dry soil; annual. Figured and described at large in Bigelow's Medical Botany.

**HYPERICUM**. *St. John's Wort*. 18—2. Calyx inferior, of one leaf, deeply divided into five nearly egg-shaped, concave, permanent segments; petals five, egg-shaped or oblong, obtuse, expanding, overlapping each other laterally; filaments numerous, hair-like, united at the base into three or five sets;

anthers small, roundish; germen superior, egg-shaped; styles varying from five to one, simple, distant; stigmas simple; capsule roundish, with as many cells as there are styles; seeds numerous.

**H. PERFORATUM**, *Perfoliate or Common St. John's Wort*: styles



three; stem two-edged; leaves elliptical, with pellucid dots; segments of the calyx lance-shaped; stems from one to two feet high, branched; flowers bright yellow, dotted and streaked with dark purple, in terminal panicles; petals and calyx fringed with small black glands. This plant has long held a place in the *Materia Medica*, being aromatic and stimulant. The flowers tinge spirits and oils of a fine purple color. Perennial; flowers in June and July; grows in dry pastures and woods.

In the good old times, when a

greater variety of popular superstitions were in vogue than at present, this plant held an important place in the ceremonies practised on the evening preceding St. John's Day, for settling the destinies, the hopes and fears of the future. *St. John's Wort* was more particularly useful in deciding the good or bad fortune of young men and maidens as to the prospect of a partner for life. They fastened the plant to the walls of their bed-chamber, and if they found it still fresh and green on the following morning, a husband or bride might be expected; but if faded and withered, another year must be passed in anxiety and loneliness.

"The young maid stole through the cottage-door,  
And blushed as she sought the plant of power;—  
Thou silver glow-worm, O lend me thy light!  
I must gather the mystic St. John's wort to-night,  
The wonderful herb whose leaf will decide  
If the coming year shall make me a bride."

## I.

### ICTODES. 4—1.

I. *FOETIDUS*, *Skunk Cabbage*. A well-known plant, common in wet grounds, as Bigelow observes, strong scented, repulsive, and exceedingly meritorious of the name it bears. It wants, however, the pungency which in some measure qualifies the skunk's offensive bat-

tery, and has only the dead, loathsome fetor, which is a better protection than the poison of the dogwood or ivy, against the meddling hands of the botanist. Still it is rather an interesting plant; its beautiful spathe, appearing before the leaves, is the first to tell us of returning spring.

I. *LEX*. *Holly*. 4—3. Calyx inferior, one-leaved, four-toothed, permanent; corolla wheel-shaped, of four elliptical segments or petals, much larger than the calyx; filaments awl-shaped, shorter than the corolla; anthers small, two-lobed; germen roundish; styles none; stigmas four, obtuse, permanent; berry globular, four-celled, each cell one-seeded; seeds oblong, pointed.

I. *OPA'CA*, *American Holly*: leaves ovate, acute, spiny, smooth, tough, shining, of a rich green above, lighter beneath; fascicles of flowers lax, peduncles compound; calyxes acute, smooth; fruit ovate; flowers numerous, scattered, small, greenish white; June. A small tree, but one of the most interesting in the American forests. In favorable situations it grows to the height of forty feet, with a diameter of twelve or fifteen inches. The foliage is singular, and rarely equalled in the richness

of its color. It is an evergreen, and on that account doubly interesting,



as we have few that are not of the cone-bearing species. Its flowers, which are scattered about the base of the older branches, are succeeded by red berries, which remain until late in the autumn.

This tree is not very abundant, but it is pretty generally disseminated, being found in all parts of the United States, excepting, perhaps, the northern parts of Maine, Vermont, and New Hampshire. The wood is fine-grained, heavy and compact; the alburnum very white, from which it is sometimes called *White Holly*. It is used for the keys of piano fortes, and a variety of other purposes.

I. CANADENSIS, *Canadian Holly*:

leaves oblong, acuminate, entire, or subserrated at the end; peduncles long, slender, axillary, one-flowered; flowers small, light green; corolla four-cleft, the segments acute, spreading; stamens long as the corolla; berries scarlet. Flowers in May; height six feet; grows in swamps.

I. CASSINE, *Brown-leaved Dahoon*: leaves alternate, distant, evergreen, lanceolate, attenuated both ways, serrated at the end. Flowers white; August; height twelve feet. This and another species, I. vomitoria, *South Sea Tea*, have bitter leaves, of which the Indians make a tea for an emetic. At a certain time of the year they visit the coast where these shrubs abound, and lighting their fires on the ground, boil a large quantity of the leaves, and drink about a pint each of the decoction, which in a short time induces a free and easy vomit. After pursuing this course, drinking and vomiting, for two or three days, they find themselves about right, and every one taking a large bundle of the branches, they return to their homes.

IMPATIENS. Balsam. 5—1. Calyx inferior, small, of two roundish, concave, unequal, deciduous leaves; corolla of five unequal pet-

als; the upper roundish, flat, erect, three-cleft, forming the upper lip; the two lower very large, reflected, obtuse, irregular, forming the lower lip; the middle two opposite, at the base of the upper lip, sometimes wanting; nectary of one leaf, tubular, oblique at the mouth, the upper edge of which is attached to the receptacle, tapering at the base into a curved spur; filaments very short, incurved; anthers united at the base; germen egg-shaped, pointed; style none; stigma undivided, short; capsules egg-shaped, five-celled, five-valved; seeds oval, attached to a central column.

I. NOLI-TANGERE, *Touch-me-not*, *Yellow Balsam*: flowers on branched axillar stalks; leaves egg-shaped, serrate, stalked; joints of the stem swelling; stem a foot high, rounded, succulent, brittle; flowers large, yellow, internally spotted with red. Annual; flowers in July and August; height about two feet; grows in wet places, by brooks and roadsides. In some places, this plant is improperly called *celandine*.

This is a handsome and interesting genus. It probably owes its name to the apparent irritability of its capsules, which, when mature, split open with an elastic spring, on the

slightest touch, scattering the seeds in every direction. Some of the species are cultivated. I. *balsamina*, *garden balsam*, is one of the most beautiful plants of the garden, forming a showy cone of finely variegated carnation-like flowers.

INDIGOFERA. Indigo. 17—4.

I. TINCTORIA, *East Indian Indigo*: leaves pinnated, oblong,



smooth, of four pairs; racemes shorter than the leaf; pods round, arcuate. Flowers in July; height three feet; introduced and cultivated.

From this plant is furnished the indigo used in dying.

INULA. 19—2. Common calyx hemispherical, imbricated, with the scales spreading at the points; compound corolla rayed; florets of the disk very numerous, perfect, tubular, with five equal, erect, or spreading segments; those of the ray numerous, strap-shaped, linear, three-toothed, without stamens; filaments thread-shaped, short; an-

thers united into a cylindrical tube, with five acute teeth above, and ten straight bristles at the base; germen oblong; style thread-shaped, cleft; stigmas spreading, oblong; seed linear, four-cornered; seed-down simple, sessile; receptacle nearly flat, naked, or slightly scaly.

I. HELENIUM, *Elecampane*: leaves egg-shaped, serrate, rugged, em-



bracing the stem, downy beneath; calyx egg-shaped, leafy; root thick, branched; stem four feet high, furrowed, branched and downy above; root-leaves stalked; flowers solitary, terminal, large, bright yellow. An infusion of the fresh root, sweetened with honey, is esteemed good for promoting expectoration. Perennial; flowers in July and August; grows in low grounds by road-sides.

IRIS. 3—1. Calyx a sheath of two leaf-like permanent valves; corolla superior, with six divisions,

the three outer largest, rounded, reflected; the three inner erect, narrow; filaments awl-shaped, lying on the reflected segments; anthers oblong, depressed; germen inferior, oblong, three-sided, with three furrows; style very short; stigmas three, very large, resembling petals, two-lipped; capsule oblong, angular, three-celled, three-valved; seeds numerous, large.

I. VERSICOLOR, *Blue Flag*: root large, horizontal, acrid; stem two or three feet high, round, on one side flexuose; sometimes branched and bearing several flowers; leaves sword-shaped, erect, sheathing the stem and equalling it in height; seeds flat; flowers purple, becoming variegated with green, yellow, and white, in the middle; June; very common in meadows and other wet places; perennial.

This genus furnishes some of the most elegant ornaments of our gardens. The flowers of *I. susiana*, *Chalcedonian Iris*, and *I. pallida*, *Pale Turkey Iris*, are large, showy, and easily cultivated; the former elegantly striped, and the latter pale yellow. *I. PERSICA*, *Persian Iris*, a small species, has very fragrant, bright yellow flowers.

ISNARDIA. 4—1. Calyx su-

perior, bell-shaped, divided into four equal egg-shaped segments; corolla none; filaments awl-shaped, shorter than the calyx; anthers oblong, simple; germen inferior, four-cornered; style cylindrical, long; stigma knobbed; capsule four-cornered, oblong, four-celled, crowned with the calyx; seeds numerous, oblong.

I. *PALUSTRIS*, *Marsh Isnardia*, *Water Purslane*: roots long, thread-like; stems bluntly four-cornered, leafy; leaves opposite, stalked, egg-shaped, bright green; two acute, small bracteas; flowers axillar, solitary, sessile, green; annual; flowers in July; floating in ponds.

## J.

JUGLANS. Walnut. 21—7.

J. *AMARA*, *Bitternut Hickory*: leaves pinnate, about nine inches long; leaflets about nine, ovate, oblong, acuminate, finely serrated, smooth on each side, the terminal one on a short stalk.

This species is generally known in New Jersey by the name of *Bitternut Hickory*; in Pennsylvania it is called *White Hickory* and sometimes *Swamp Hickory*; further south it is compounded with the pignut hickory; the French of Illi-

nois, like the inhabitants of New Jersey, give it the name of *Bitternut*, which, as it indicates one of the peculiar properties of the fruit, we have chosen to retain. It is nowhere found much beyond the boundaries of Vermont, in latitude forty-five degrees. It is not seen in the state of Maine, where the borders of the rivers offer situations analogous to those in which it abounds a few degrees further south.

Near New York, and in the bottoms which stretch along the Ohio, it grows to the height of seventy or eighty feet, with a circumference of ten or twelve feet. It attains these dimensions only in spots where the soil is excellent, constantly cool, and often inundated by creeks and rivers. It is probably because it thrives most in such situations, that it is sometimes called *Swamp Hickory*. Of all the hickories the vegetation of this species is the latest; the leaves do not unfold until a fortnight after the others. The fruit is ripe about the beginning of October. It is broader than it is long, being six or seven lines one way and ten lines the other. The shell is white, smooth, and thin enough to be broken by the fingers. The kernel is remarkable for the deep inequalities



produced on every side by its foldings. It is so harsh and bitter, that squirrels and other animals will not feed upon it, while any other nut is to be found.

In the texture of its bark, and in the color of its heart and sap, this tree resembles the other hickories, and its wood possesses, though in an inferior degree, the weight, strength, tenacity and elasticity, which so plainly distinguish them. It is used for fuel, but it is not much superior to white oak. In some parts of Pennsylvania, where this tree is multiplied, an oil is extracted from the nuts, which is used for the lamp and for other inferior purposes.

**J. AQUATICA, Water Bitternut.** This species of hickory is confined to the southern states, and is confounded with the pignut hickory, though different from it in many respects. It always grows in swamps, and in the ditches which surround the rice fields.

It grows to the height of forty or fifty feet, and its general appearance resembles the other hickories. Its leaves are eight or nine inches long, and of a beautiful green. They are composed of four or five pair of sessile leaflets surmounted by a petiolated odd one. The leaflets are ser-

rate, four or five inches long, eight or nine lines broad, and very similar to the leaves of the peach tree. The husk is thin, and the nuts are small, angular, a little depressed at the sides, somewhat rough, of a reddish color and very tender. The kernel is formed in folds like that of the preceding species: as may be supposed it is not eatable.

The wood of this tree, though partaking of the common properties of the hickories, is in every respect inferior to the others, from the nature of the grounds on which it grows. The southern parts of the United States possess many sorts of timber more useful in building, to which purpose this, like the other hickories, is poorly adapted.

**J. CINEREA, Bitternut:** leaves pinnate, fifteen or sixteen inches long, with about eight pairs of leaflets, and a terminal odd one; leaflets oblong, lanceolate, serrated, soft, downy beneath; petioles viscid; fruit oblong, ovate. Barren flowers on large cylindrical aments, which are single, four or five inches long, and attached to the shoots of the preceding year; fertile flowers attached to the new growth.

This species of walnut is known in the United States under different

denominations. In Massachusetts, New Hampshire and Vermont, it bears the name of *Oil Nut*; in Pennsylvania and Maryland, and on the banks of the Ohio, it is generally known by that of *White Walnut*; in Connecticut, New York, New Jersey, Virginia and the mountainous districts of the upper parts of the Carolinas it is called *Butternut*. The last of these names we have adopted, because it is most generally used. This tree is found in the Canadas, in all of the New England states, New York, New Jersey, Kentucky, Tennessee and on the banks of the Missouri, and in the bottoms which border on the Ohio. It flourishes most abundantly in a cold unproductive soil, interspersed with large rocks, and on the steep, elevated banks of rivers.

In favorable situations this tree grows to the height of fifty or sixty feet, with a circumference of ten or twelve feet, five feet from the ground. Its roots extend even with the surface of the earth, in a serpentine direction, and with little variation in size, to the distance of forty feet. The trunk ramifies at a small height, and the branches, seeking a direction more horizontal than those of other trees, and spreading widely,

form a large and tufted head, which gives the tree a remarkable appearance. The bark of the secondary branches is smooth and grayish. The buds, like those of the black walnut, are uncovered. In spring its vegetation is forward, and its leaves unfold a fortnight earlier than those of the hickories. The fruit is commonly single, and suspended by a thin, pliable peduncle, about three inches in length; its form is oblong-oval, without any appearance of seam. It is often two and a half inches in length, and five inches in circumference, and is covered with a viscid adhesive substance, composed of small transparent vesicles, which are easily discerned with the aid of a lens. The nuts are hard, oblong, rounded at the base, and terminated at the summit in an acute point; the surface is very rough, and deeply and irregularly furrowed. They are ripe from the middle to the end of September, a fortnight earlier than the other species of walnut. The kernel is thick and oily, and soon becomes rancid; hence, doubtless, are derived the names of *Oil Nut* and *Butternut*.

The black walnut and butternut when young, resemble each other in their foliage, and in the rapidity of

their growth ; but when arrived at maturity their forms are so different as to be distinguishable at first sight. Remarkable peculiarities are also found, on examining their wood, especially when seasoned ; the black walnut is heavy, strong, and of a dark brown color ; while the butternut is light, of little strength, and of a reddish hue ; but they possess in common the great advantage of durability, and of being secure from the annoyance of worms. From its want of solidity and from the difficulty of procuring pieces of considerable length, the timber of the butternut is seldom used in the construction of houses. As it long resists the effects of heat and moisture, it is esteemed for the posts and rails of rural fence. For corn shovels and wooden dishes, it is preferred to the red-flowering maple, because it is lighter and less liable to split. In Vermont it is used for the pannels of coaches and chaises ; the workmen find it excellently adapted to this object, not only from its lightness, but because it is not liable to split, and receives paint in a superior manner.

The medicinal properties of the butternut bark have long since been proved, by several eminent physi-

cians of the United States. An extract in water, or even a decoction sweetened with honey, is acknowledged to be one of the best cathartics afforded by *materia medica*. If the trunk of this tree is pierced in the month which precedes the unfolding of the leaves, a pretty copious discharge ensues of a slightly sugary sap, from which, by evaporation, sugar is obtained, inferior to that of the sugar maple.

*J. SULCATA, Thick Shellbark Hickory, Shagbark* : leaves pinnate ; leaflets seven to nine, lanceolate, acuminate, serrate, downy beneath, the odd one sessile ; fruit squarish, smooth ; ripe about the beginning of October ; flowers as in the last species.

This species bears a striking analogy to the shellbark hickory, and is frequently confounded with it by the inhabitants of the western country : some of them distinguish it by the name of *Thick Shellbark Hickory*, which should be preserved as its appropriate denomination. East of the Alleghanies this tree is rare, and is found only in a few places ; it grows on the banks of the Schuylkill, and in the vicinity of Springfield, in Pennsylvania, where its fruit is called *Springfield nut*.

It is also found in the county of Gloucester, in Virginia, under the name of *Gloucester Walnut*. It abounds on the banks of the Ohio and the rivers which empty into it. It grows to the height of eighty feet, and its ample head is supported by a straight trunk, in diameter proportioned to its elevation. The bark exhibits the same singular arrangement with that of the shellbark hickory: it is divided into strips from one to three feet long, which are warped outwards at the end, and attached only in the middle. They fall, and are succeeded by others similarly disposed. It is only observable that in this species the plates are narrower, more numerous, and of a lighter color. The outer scales of the buds do not adhere entirely to the inner ones, but retire as in the shellbark hickory. The leaves also, which vary in length from eight to twenty inches, observe the same process in unfolding, and are similar in size, configuration and texture; but they differ in being composed of seven leaflets, and sometimes of nine, instead of five, the invariable number of the shellbark hickory. The barren aments are disposed in the same form, though they are, perhaps, a

little longer than in the other species. The fertile flowers appear, not very conspicuous, at the extremity of the shoots of the same spring. They are succeeded by a large oval fruit, more than two inches long, and four or five inches in circumference. Like that of the shellbark hickory, it has four depressed seams, which, at its complete maturity, open through their whole length for the escape of the nut. The nut of this species is widely different from the other; it is nearly twice as large, it is longer than it is broad, and is terminated at each end in a firm point. The shell is also thicker and of a yellowish hue, while that of the shellbark nut is nearly white.

The thick shellbark hickory, as has been said, is nearly related to the shellbark hickory, and its wood, which is of the same color and texture, unites the peculiar qualities of that species with such as are common to the hickories. It is applied to similar purposes as that of the shellbark hickory.

J. MYRISTICIFOLIA, *Nutmeg Hickory*: leaves pinnate; leaflets seven, ovate, acuminate, serrate, smooth; nuts very small, smooth, of a brown color marked with long,

itudinal white lines, so as somewhat to resemble a nutmeg, the shell being very thick and hard; the husk thin, roughish on the surface; found in the middle states.

J. NIGRA, *Black Walnut*: leaves pinnate, about eighteen inches long, with from seven to nine pairs of leaflets; leaflets lanceolate; petioles downy; fruit globose, dotted, rough. This tree is known in all parts of the United States where it grows, and to the French of the Canadas and Louisiana, by no other name than Black Walnut. East of the Alleghanies, the most northern point at which it appears is about Goshen, in New Jersey, in the latitude of forty degrees fifty minutes. West of the mountains, it exists abundantly two degrees further north, in that portion of Genessee which is comprised between the seventy-seventh and seventy-ninth degrees of longitude. This tree is multiplied in the forests in the vicinity of Philadelphia, and with the exception of the lower parts of the southern states, where the soil is too sandy, or too wet, as in the swamps, it is met with to the banks of the Mississippi, throughout an extent of two thousand miles. East of the Alleghanies in Virginia, and in the

upper parts of the Carolinas and of Georgia, it is chiefly confined to the valleys where the soil is deep and fertile, and which are watered by creeks and rivers. On the banks and islands of the Ohio, the black walnut attains the elevation of sixty or seventy feet, with a diameter of three to seven feet. Its powerful vegetation clearly points out this as one of the largest trees of America. When it stands insulated, its branches, extending themselves horizontally to a great distance, spread into a spacious head, which gives it a very majestic appearance. The bark is thick, blackish, and on old trees deeply furrowed. The leaves when bruised emit a strong aromatic odor. They are about eighteen inches in length, pinnate, and composed in general of six, seven or eight pair of leaflets, surmounted by an odd one. The leaflets are opposite, and fixed on short petioles; they are acuminate, serrate and somewhat downy. The barren flowers are disposed in pendulous and cylindrical aments, of which the peduncles are simple, unlike those of the hickories. The fruit is round, odoriferous, of rather an uneven surface, and always appears at the extremity of the branches: on young

and vigorous trees it is sometimes seven or eight inches in circumference. The husk is thick, and is not, as in the hickories, divided into sections; but when ripe it softens and gradually decays. The nut is hard, somewhat compressed at the sides, and sulcated. The kernel, which is divided by firm ligneous partitions, is of a sweet and agreeable taste, though inferior to that of the European walnut. The size of the fruit varies considerably, and depends upon the vigor of the tree, and upon the nature of the soil and climate. Some variations are observed in the form of the fruit, and in the moulding of the shell, which are considered only as accidental differences.

When the wood of this tree is freshly cut, the sap is white, and the heart of a violet color, which, after a short exposure to the air, assumes an intenser shade, and becomes nearly black: hence probably is derived the name Black Walnut. There are several qualities for which its wood is principally esteemed: it remains sound for a long time, even when exposed to the influences of heat and moisture; but this observation is only applicable to the heart, the sap speedily decays: it is

very strong and very tenacious: when thoroughly seasoned it is not liable to warp and split; and its grain is sufficiently fine and compact to admit of a beautiful polish. It possesses, in addition to these advantages, that of being secure from worms. On account of these excellences, it is preferred and successfully employed in many kinds of work. East of the Alleghanies, its timber is not extensively used in building houses; but, in some parts of Kentucky and Ohio, it is split into shingles which serve to cover them: sometimes also this timber enters into the composition of the frame. But it is chiefly in cabinet-making that this wood is employed wherever it abounds. By selecting pieces from the upper part of the trunk, immediately below the first ramification, furniture is sometimes made which, from the accidental curlings of the grain, is highly beautiful: but as its color soon changes to a dusky hue, the wild cherry wood is frequently preferred for this use. The black walnut is also employed for the stocks of military muskets; it is stronger and tougher than the red-flowering maple, which, from its superior lightness and elegance, is chosen for

fowling-pieces. In Virginia, posts are very commonly made of this wood, and as it lasts undecayed in the ground from twenty to twenty-five years, it appears every way fit for this purpose. It also makes excellent naves for wheels, which further proves its strength and durability. The timber of this tree is also excellently adapted to certain uses in naval architecture. It should never be wrought till it is perfectly seasoned, after which it is asserted to be more durable, though more brittle, than the white oak. It is asserted that this wood, like the live oak, is not liable to be attacked by sea worms in warm climates. The husk of the fruit yields a color similar to that which is obtained from the European walnut. It is used in the country for dying wool-len stuffs.

J. OLIVEFORMIS, *Pekan Nut*: leaves pinnate, from twelve to eighteen inches long, with seven or eight pairs of leaflets, and a terminal odd one; leaflets lanceolate, serrated, the odd one with a long stalk; fruit oblong, four-cornered. This tree is partial to cold, wet grounds, and is most multiplied on the rivers of the western states. It is a beautiful tree, reaching the height of sixty or

seventy feet, with a proportionate diameter. The nuts, which are usually abundant, are contained in a husk, from one to two lines thick, and have four slightly prominent angles, corresponding to their internal divisions. They vary in length from an inch to an inch and a half, are pointed at the extremities, of a cylindrical form, and of a yellowish color, marked, at the period of perfect maturity, with blackish or purple lines. The shell is smooth and thin, though too hard to be broken by the fingers: the kernel is full, and not being divided by ligneous partitions, is easily extracted. These nuts, which are of a very sweet taste, form an object of petty commerce between Upper and Lower Louisiana. From New Orleans they are exported to the West Indies, and to the ports of the Atlantic states.

The wood of the pekan nut is coarse-grained, and, like the other hickories, heavy and compact: it also possesses great strength and durability; but in these respects it is inferior to many other species of this genus, although it merits attention, and, by assiduous cultivation, may be brought to a high degree of perfection.

**J. TOMENTOSA, Mockernut Hickory:** leaves pinnate, eighteen or twenty inches long, with four pairs of leaflets and a terminal odd one; leaflets large, sessile, ovate-acuminate, serrate, hairy beneath; barren flowers on pendulous, downy, axillary aments, six or eight inches long; fertile flowers inconspicuous and situated at the extremity of the young shoots. This tree is met with in the forests near the Atlantic coast from Massachusetts to Georgia. In situations favorable to its growth, it reaches the height of sixty feet, with a diameter of eighteen or twenty inches. Its trunk is covered with a thick, hard and rugged bark. The buds are large, of a grayish white, and very hard; in the winter, after the falling of the leaf, they afford the only characteristic by which the tree can be distinguished, when it exceeds eight or ten feet in height. The fruit is ripe about the middle of November. It is odorless, sessile or rarely pedunculated, and commonly united in pairs. In form and size, it exhibits remarkable varieties: on some trees it is round, with depressed seams, on others oblong, with angular or prominent seams; it is sometimes two inches long, and twelve or fifteen lines in

diameter, and at other times less than half this size. It differs also in weight, as well as in configuration and volume, varying from one dram to four. The largest nuts might be confounded with those of the thick shellbark hickory, and the smallest with those of the pignut hickory. The shell is very thick, somewhat channelled, and extremely hard. The kernel is sweet, but minute, and difficult to extract, on account of the strong partitions which divide it; hence, probably, is derived the name of *Mockernut*.

The wood of this tree is of the same color and texture with the other hickories, and characterized by the qualities which render this class of trees so remarkable. It is particularly esteemed for fuel, for which use trees six or eight inches in diameter are preferred. At this stage of its growth, while the heart, the proper color of which is reddish, is not yet developed, it frequently goes by the name of *White-heart Hickory*. In the country, a greenish color is sometimes extracted from the bark, but it is not extensively used.

**J. ALBA, Shellbark Hickory:** leaves pinnate, sixteen to twenty inches long, with two pairs of leaf-



lets and a terminal odd one; leaflets large, ovate-acuminate, rough and downy beneath, the odd one sessile; nut small, white, compressed at the sides, and marked by four distinct angles, which correspond to the di-



visions of the husk; ripe about the first of October. This tree owes its name to the singular disposition of its outer bark, by which it is readily distinguished from the other species. This bark is divided into long, narrow plates, which, curving outwards at the ends, adhere only by the middle, giving the trunk a rough, shaggy appearance. It abounds in the Atlantic states from Massachusetts to North Carolina, and is occasionally met with further south and west. Of all hickories, this species grows to the greatest height with proportionally the smallest diameter, for it is sometimes seen eighty or ninety feet in height, and less than two feet thick. The trunk is

destitute of branches, regularly shaped, and of an almost uniform size for three-fourths of its length, thus forming a very fine tree.

The wood of the shellbark hickory possesses all the characteristic properties of the hickories, being strong, elastic and tenacious. It has also their common defects of soon decaying and of being eaten by worms. As this tree grows to a great height with nearly a uniform diameter, it is sometimes employed for the keels of vessels. Its wood is found to split most easily, and to be the most elastic; for this reason it is used for making baskets, and also for whip-handles, which are esteemed for their suppleness.

*J. PORCINA, Pignut Hickory:* leaves pinnate, about eighteen inch-



es long, with three pairs of leaflets and a terminal odd one; leaflets four or five inches long, acuminate, serrate, nearly sessile, smooth on both sides; barren aments smooth, filiform, flexible, pendulous; fertile

flowers greenish, inconspicuous, situated at the extremity of the shoot. This hickory abounds in the forests generally throughout the United States, except the cold range of the Alleghanies and the north parts of New York and New England. In favorable situations, it grows to the height of seventy or eighty feet, with a diameter of three or four feet, being one of our largest forest trees. The fruit succeeds the fertile flowers generally in pairs. It is ripe in October, and often covers the naked branches long after the foliage is shed. The husk is thin and of a beautiful green: when ripe, it opens through half its length, for the passage of the nut. The nut is small, smooth, and very hard, on account of the thickness of the shell. Its kernel is sweet, but meagre and difficult to extract, from the firmness of the partitions. The form and size of these nuts vary more than in any other species. Some are oval, and when covered with their husks resemble young figs; others are broader than they are long, and others are perfectly round. Among these various forms, some nuts are as large as the thumb, and others not bigger than the little finger.

The wood of the pignut hickory resembles that of the other species in the color of its sap and of its heart; it possesses also their excellences and their defects. It is the strongest and most tenacious of the hickories, and for this reason is preferred to any other for axletrees and axe-handles. These considerations highly recommend its cultivation.

JUN'CUS. Rush. 6—1. Calyx inferior, of six oblong, acute, permanent leaves, three of them internal; corolla none; filaments thread-like, short, three of them sometimes wanting; anthers oblong, erect, two-celled; germen superior, triangular; style simple, cylindrical, short; stigmas three, elongated, downy; capsule triangular, three-celled, three-valved; seeds numerous, minute, roundish.

J. TENU'is, *Slender Rush*: culm roundish, undivided, leafy at the base; leaves slender, linear, channelled on the upper side; corymb terminal, with a long, leafy involucre; leaves of the calyx acuminate, larger than the obtuse, three-sided capsule; flowers in June; perennial; common by foot-paths and roadsides.

J. EFFUSUS, *Soft Rush*, *Bulrush*:

culm naked, straight, faintly striated; panicle repeatedly compound; capsule obtuse, a little shorter than the calyx; root creeping; straws soft and pliant, pale green, about two feet high; panicle very loose, about half way down the straw; leaves of the calyx finely pointed. In Europe, the pith of this and the following species is dipped in melted tallow, and used by the poorer classes under the name of rush-light. "Who'll buy a farthing rush-light!"—*Cries of London.*

*J. CONGLOMERA'TUS, Common Rush:* culm naked, straight, faintly striated; panicle very dense, globular, repeatedly branched; capsule abrupt; stamens three; root creeping; straws soft, pliant, about two feet high; panicle forming a dense globular head of brown flowers; leaves of the calyx pointed; straw larger than in the last species; perennial; flowers in July; grows in wet grounds.

*J. FILIFOR'MIS, Slender Rush:* culm naked, slender, drooping; panicle few-flowered, corymbose; capsule nearly globular; root creeping; straws very slender, pliant, pale green, about a foot high; flowers from five to eight; perennial;

flowers in August; grows in wet grounds.

*J. TRIFI'DUS, Three-leaved Rush:* culm naked; radical leaves very few; bractees three, leafy; a terminal head of about three flowers; root creeping; straws crowded, thread-shaped, erect, from four to six inches high; radical leaves one or two, very short; bractees three, at the top of the straw, resembling leaves; perennial; flowers in July; grows in wet grounds.

*J. BUFO'NIUS, Toad Rush:* culm branched, leafy; leaves angular, channelled; panicle forked, longer than the bractees; leaves of the calyx lance-shaped, taper-pointed, membranous, two-ribbed, longer than the capsule; root fibrous; straws numerous, crowded, from four inches to a foot high; annual; flowers in July and August; grows in marshy ground, ditches, &c.; common.

*J. SUBVERTICILLA'TUS, Whorl-headed Rush:* culm leafy, decumbent; leaves bristle-shaped, channelled, slightly jointed; panicle forked; heads lateral and terminal, somewhat whorled; capsule obtuse, rather longer than the calyx; root fibrous; stems crowded, decumbent or floating, from six inches to a foot

long; perennial; flowers in July and August; grows in watery places; common.

*J. BULBO'SUS*, *Bulbous Rush*, *Black Grass*: culm leafy at the base, compressed, undivided; leaves linear, channelled; panicle cymose; capsule obtuse; flowers in July; height one foot; abundant in salt marshes; makes good fodder.

*J. POLYCEPHALUS*, *Many-headed jointed Rush*: leaves apparently jointed, cylindrical; panicle twice or thrice forked, erect; heads many-flowered, resembling small burs; leaves of the calyx lance-shaped, acute, rather shorter than the capsule; ramifications of the panicle simple; perennial; grows in meadows and low grounds.

**JUNIPERUS.** Juniper. 22—13. Barren flowers: catkin conical, with three or more rows of whorled, imbricated, oval scales, three in each whorl, and one at the end; corolla none; filaments in the terminal flower three, awl-shaped, united at the base, in the other flowers hardly perceptible; anthers three, two-lobed, in the terminal flower distinct, in the others fixed to the base of the scale.

Fertile flowers: calyx superior, with three very small permanent

segments, united to the germen; petals three, acute, stiff, permanent; germen roundish; styles three, very short; stigmas simple; berry roundish, with three small tubercles at its lower part, being the points of the calyx now united to the fruit, and three small teeth at the summit, originating from the petals; seeds oblong, hard, convex externally, angular internally.

*J. VIRGINIANA*, *Red Cedar*: leaves ternate, adnate at the base, younger



imbricated, old ones spreading.—This tree owes its name to the color of the perfect wood, which is of a bright reddish tint. The red cedar, which belongs to the junipers, is the most common species of its genus in the United States, and the only one which attains such dimensions as to be useful in the arts. In some parts of the United States it is improperly called Savin. Cedar Island

in lake Champlain, in latitude forty-four degrees twenty-five minutes, may be assumed as one of the remotest points at which it is found towards the north. Eastward, on the border of the sea, it is not found beyond the river Kennebec, from which it spreads without interruption to the cape of Florida, and thence round the gulf of Mexico to a distance beyond St. Bernard's bay; an extent of more than three thousand miles. In retiring from the shore it becomes gradually less common and less vigorous, and in Virginia and the more southern states it is rare at the point where the tide ceases to flow in the rivers; further inland it is seen only in the form of a shrub in open, dry and sandy places. In the western states, it is confined to spots where the calcareous rock shows itself naked, or is so thinly covered with mould as to forbid the vegetation of other trees.

In situations where the soil and climate are favorable to the expansion of this tree, it grows to the height of forty or forty-five feet, with a diameter of twelve or thirteen inches. The most striking peculiarity in the vegetation of the red cedar is that of its branches, which

are numerous and close, spring near the earth, and spread horizontally, and that the lower limbs are during many years as long as the body of the tree. Its diameter is very much diminished by deep, oblong crevices in every part of the trunk, which are occasioned by the large branches persisting after they are dead. The foliage is evergreen, numerous subdivided, and composed of small, sharp scales, enclaved in one another. The male and female flowers are small, not conspicuous, and borne separately on the same or on different stocks, and put forth in May or June. The seeds are small, ovate berries, bluish when ripe, and covered with a white exudation. The wood is odorous, compact, fine-grained and very light, though heavier and stronger than that of the white cedar or cypress. To these qualities it unites the still more precious character of durability, and is consequently highly esteemed for such objects as require it in an eminent degree. But as it is procured with difficulty, and is every day becoming scarcer, it is reserved exclusively for the most important purposes. In the upper part of the frame of vessels it is joined with

the live oak to compensate its excessive weight, and this usage, more than any other, has wasted the species. The nearer this tree grows to the sea, and the further southward, the better the wood. Next to ship-building it is commonly used for posts, which are highly esteemed, and are reserved for inclosing courtyards and gardens in the cities and their vicinity, and likewise for the posts and rails of rural fence. It is eminently fitted for subterranean water-pipes, but is rarely employed, from the difficulty of obtaining stocks of sufficient diameter. It is also employed for small tubs and pails, which are hooped with brass, and is used in the manufacture of lead pencils.

*J. COMMUNIS, Common Juniper*: leaves three in each whorl, thorn-pointed, spreading, longer than the ripe fruit; stem erect. A shrub, from two to five feet high, with very numerous branches; leaves linear, channelled and glaucous above, convex and keeled beneath, three in each whorl; flowers axillar, sessile, small; berries globular, bluish black, sweetish, with a strong taste of turpentine. The berries are used in Holland in the distillation of gin. Grows in dry woods.

## K.

## KALMIA. 10—1.

*K. LATIFOLIA, Mountain Laurel, Calico Tree, Spoon-wood*: leaves ovate, elliptical, ternate and scattered; corymbs terminal; leaves evergreen, thick, tough, very smooth and shining, of a brilliant green above, somewhat pale beneath; flowers white, or tinged with red; corolla one-petalled, the margin erect, five-cleft; stamens ten, curving outwards towards the corolla, in which are ten cavities which receive and confine the anthers; as the corolla decays, the anthers are liberated, and thrown forcibly against the stigma, by the elasticity of the filaments. The flowers, which are abundant, generally covering the whole shrub, are somewhat glutinous, and have a faint, but very delicate and agreeable fragrance. It is found in all the Atlantic states from Maine to Georgia, sometimes near the sea-coast, but more generally inland. In the neighborhood of New Haven, it grows within a mile of the shore to the height of eighteen or twenty feet. The wood, which in some situations grows very crooked, is compact, fine-grained, and marked with red lines. It is

used for the handles of tools, small boxes, screws, &c. The leaves are narcotic, and poisonous to some animals.

A smaller species, *K. ANGUSTIFOLIA*, *Sheep-poison*, with small rose-colored flowers, is common in low grounds. It is also known by the names of *Laurel* and *Lamb-kill*. The shape and structure of the flowers similar to the last species.

## L.

**LACTUCA.** Lettuce. 19—1. Common calyx cylindrical, of numerous, pointed, imbricated, unequal, flat scales, membranous at the margin; compound corolla imbricated, uniform; florets numerous, perfect, equal, strap-shaped, abrupt, with four or five teeth; filaments hair-like, very short; anthers united into a cylindrical tube; germen somewhat egg-shaped; style thread-shaped, as long as the stamens; stigmas two, reflected; seeds egg-shaped, furrowed, roughish, compressed; seed-down hair-like, stalked; receptacle naked, dotted.

*L. ELONGATA*, *Tall Lettuce*: leaves smooth beneath, the lower ones runicinate, amplexicant, upper lanceolate, sessile; stem four or five feet

high; panicles large, spreading, terminal; flowers yellow; July, August. This plant is generally among the first that appear on grounds cleared and burnt, and sometimes constitutes the principal vegetation, its heads of seed-down forming at one period an unbroken field, of singular appearance. The whole plant abounds in an acrid, milky juice. Two other species, *L. INTEGRIFOLIA*, *Arrow-leaved Lettuce*, and *L. SANGUINEA*, *Wood Lettuce*, are described by Bigelow; the former resembling *L. elongata*, and the latter with dark purple stems and crimson flowers. The common garden lettuce is the *L. SATIVA*.

All the species abound in a milky juice, which is found to partake, in a considerable degree, of the qualities of opium; on this account, eating lettuce in salads is generally followed by drowsiness.

**LAMIUM.** Dead-nettle, Archangel. 14—1. Calyx of one leaf, tubular, becoming wider towards the mouth, with five nearly equal, awn-tipped teeth; corolla gaping; tube cylindrical, very short; limb open; throat inflated, compressed, bulging, bordered at each side with one or more little reflected teeth; upper lip vaulted, roundish, obtuse;

lower lip shorter, inversely heart-shaped, notched; filaments awl-shaped, covered by the upper lip; anthers oblong, hairy; germen four-cleft; style thread-shaped, of the length of the stamens; stigma divided into two acute, spreading segments; seeds four, short, three-cornered, convex on one side, at the bottom of the calyx.

*L. PURPUREUM*, *Red Dead-nettle*, or *Archangel*: leaves heart-shaped, bluntish, unequally crenate, stalked, the upper ones crowded; tube of the corolla closed near the bottom with hairs; root fibrous; stem curved at the base and branched, then erect, densely leafy at the top; flowers purplish red; annual; grows in loose soil.

*L. AMPLEXICAULE*, *Hem-bit Dead-nettle*: leaves broadly heart-shaped, obtuse, deeply crenate, the upper ones embracing the stem; lower leaves stalked, upper sessile, all hairy; corolla with the upper lip crimson and downy, the lower pale and spotted. It frequently occurs with a small externally hairy corolla, which never expands. Annual; flowers in the summer months; grows in loose soil; naturalized.

*LARIX*. Larch. 21—8.

*L. MICROCARPA*, *Red Larch*, *Hack-*

*matack*: leaves fascicled, deciduous; cones roundish, few-flowered; scales reflexed; bracteos panduriform, bluntly acuminate. This tree is most abundant in Vermont, New Hampshire, and the state of Maine; but though the soil is well adapted to its growth, and the winter is long and severe, it does not form a hundredth part of the resinous growth, which consists principally of the black and



the hemlock spruce and the red cedar. It grows in the Canadas, and extends as far north as lake St. John, where it begins to abound, and to form masses of woods, some of which are several miles in extent. It is profusely multiplied also in Newfoundland, New Jersey, Pennsylvania, and the coldest and most gloomy exposures in the mountainous tracts of Virginia, which are



the limits of its appearance towards the south; but it is rare in these states, and in Lower Jersey it is seen only in the swamps of white cedar, with which it is scantily mingled. In Vermont, New Hampshire and Maine it grows only in low and moist places, and never on uplands, as about Hudson's bay and in Newfoundland; hence we may conclude that the climate of the northern part of the United States is too mild for its constitution.

The American larch is a magnificent vegetable, with a straight, slender trunk, eighty or a hundred feet in height and two or three feet in diameter. Its numerous branches, except near the summit, are horizontal or declining. The bark is smooth and polished on the trunk and lower limbs, and rugged on the lower branches. The leaves are flexible, and collected in bunches; they are shed in the fall and renewed in the spring. The flowers, like those of the pines, are separate, upon the same tree; the male aments, which appear before the leaves, are small, oblong and scaly, with two yellow anthers under each scale; the female flowers are also disposed in aments, and are composed of floral leaves covering two ovaries,

which in process of time become small, erect, scaly cones, three or four lines long. At the base of each scale lie two minute, winged seeds. On some stocks the cones are violet-colored in the spring, instead of green; but this is an accidental variation, for the trees are in no other respect peculiar.

The wood of the American larch is superior to any species of pine or spruce; it is exceedingly strong and singularly durable. In Canada it is considered as the most valuable timber, and has no fault except its weight. In the state of Maine it is esteemed more than any other species of resinous wood for the knees of vessels, and is always used for this purpose when proper pieces can be obtained. This wood is justly appreciated in the United States, but it is little employed, because it is rare, and may be replaced with other species which are cheaper and more abundant.

LATHYRUS. 17—4. Calyx superior, cup-shaped, unequal, with five lance-shaped segments, the two upper shorter, the lower one longest; corolla of five petals; standard largest, inversely heart-shaped, reflected at the sides; wings oblong, obtuse, somewhat curved upwards,

approaching each other; keel rounded, of two united petals, with separate claws; filaments ten, nine united into a compressed tube, open at the upper edge, the other hair-like, separate; anthers small, roundish; germen oblong, compressed; style ascending, flattened vertically, dilated upwards, acute at the end; stigma longitudinal, downy, running along the upper half of the style; legume long, cylindrical or compressed, pointed, one-celled, two-valved; seeds several, roundish.

*L. PALUSTRIS, Marsh Lathyrus*: tendrils branched, each with several lance-shaped segments; stipules lance-shaped; stem winged; flowers variegated with blue and purple; perennial; flowers in July and August; grows in wet meadows and thickets.

There are many species of lathyrus, some of which are very ornamental, and cultivated in gardens; the one most popular with us is *L. ODORATUS, Sweet Pea*: its flowers are very fragrant and beautiful. *L. MARITIMUS, Beach Pea*, described by Bigelow, is a pretty plant, with large, showy flowers, common on our beaches.

**LAURUS.** Laurel. 9—1.

*L. BENZOIN, Fever-bush, Spice-*

*wood*: leaves nerveless, ovate, acute at each end, entire, annual; umbels sessile; calyx six-cleft, segments oblong; flowers succeeded by red berries; flowers in May; height sometimes six or seven feet, generally two to four. This is an aromatic shrub, with a singular flavor resembling gum benzoin; the bark has a pleasant, spicy taste. It is found in moist woods in the neighborhood of swamps.

*L. SAS'SAFRAS, Sassafras*: leaves entire and two or three-lobed; flow-



ers dioecious; leaves four or five inches long, alternate, petiolated, on young shoots oval, on the summit three-lobed; flowers greenish yellow, appearing before the leaves, in clusters, at the end of the last year's growth; May, June. This tree abounds in all parts of the United States. In the forests of the west, it attains the height of fifty or sixty feet, with a trunk of propor-

tionate diameter. The bark which covers old trees is of a grayish color, and is chapped into deep cracks. On cutting into it, it exhibits a dark, dull red, a good deal resembling the color of the Peruvian bark. The bark of the young branches is smooth, and of a beautiful green color. The old trees give birth to hundreds of shoots, which spring up at little distances, but which rarely rise higher than six or eight feet. Every part of the tree has a fragrant odor, and a sweetish, aromatic taste, most powerful in the bark of the root. The young shoots abound in mucilage. The wood of this tree is not strong, and branches of considerable size may be broken with a slight effort. In the young tree the wood is white; in those which exceed fifteen or eighteen inches in diameter it is reddish, and of a closer grain. It is not, however, in these respects to be compared with the oak and hickory. Stripped of its bark, it resists for a considerable period the progress of decay; and it is on this account employed for the posts and rails of rural fence. It is also sometimes used for the joists and rafters in houses built of wood. It is said to be secure from the attacks of worms: this advantage is

attributed to its odor, which it preserves as long as it is sheltered from the sun and rain. Bedsteads made of it are said to be never infested with insects. But for these purposes the sassafras wood is not in habitual use, and is only occasionally employed. For fuel it is held in little esteem, and it is only in the cities of the southern states, which are not, like those of the north, abundantly furnished with fuel, that it is brought into the market: it is considered as wood of the third quality. Its bark contains a considerable portion of air, and snaps while burning like that of the chestnut. An agreeable beverage may be made by boiling the young shoots in water, to which a certain quantity of molasses is added, and the whole is left to ferment: this beer is considered as a very salutary drink during the summer. Mucilage of sassafras pith is peculiarly mild and lubricating, and has been used with much benefit in dysentery and catarrh, and particularly as a lotion in the inflammatory stages of the ophthalmia. The twigs of both these species are important ingredients in *diet-drinks*, and other nostrums of domestic practice. They are at least simple and harmless,

though the frequent practice of chewing the root, so common among children, is thought to be injurious.

**L. CAROLINENSIS, Red Bay:** leaves alternate, oval-lanceolate, glaucous beneath, perennial; peduncles axillary; fruit oval; flowers in April or May; common in the Atlantic states south of Virginia. In favorable situations, the red bay often attains the height of sixty or seventy feet, and from twelve to fifteen inches in diameter: when arrived at this stature, its trunk is generally crooked, and divided into several thick limbs, at eight, ten or twelve feet from the ground. Upon old trunks the bark is thick and deeply furrowed; that of the young branches, on the contrary, is smooth, and of a beautiful green color. The leaves are about six inches long, alternate, oval-acuminate, whitish or glaucous on the lower surface, and evergreen. The flowers, which open in April or May, are disposed in small, axillary branches, springing between the leaf and the twig, and are supported by slightly downy peduncles. The fruit or seed is oval, and very similar to that of the sassafras. The seeds germinate with ease, and the old trees are surrounded by hundreds of young plants.

The wood of this tree is of a beautiful rose-color; it is strong, has a fine, compact grain, and is susceptible of a brilliant polish. Before mahogany became the reigning fashion in cabinet-making, this wood was commonly employed in the southern states, and afforded articles of furniture of the highest beauty. This wood, like that of the red cedar, may be usefully employed in ship-building, as it unites the properties of strength and durability. The leaves of this tree, when bruised, diffuse a strong odor resembling that of the sweet bay, *Laurus nobilis*, and may be employed in cookery.

There are several other species of *laurus* indigenous to the United States, mostly small shrubs of little note. **L. CINNAMOMUM** of Ceylon furnishes the cinnamon of commerce. This tree grows to the height of thirty or forty feet. The cinnamon consists of the inner bark of trees not more than eighteen years old. **L. CAMPHORA, Camphor Tree**, yields the camphor of the druggists; it is extracted by distillation from the leaves, roots and bark. This tree grows to the height of forty or fifty feet.

**LEMNA. Duckweed, Duckmeat.**

21—2. Calyx of one leaf, membranous; corolla none; stamens thread-shaped, lateral, unequal, longer than the calyx; anthers of two globes; germen superior, egg-shaped; style shorter than the stamens; capsule one-celled, globose, containing one seed.

L. TRISUL'CA, *Ivy-leaved Duckweed*: leaves stalked, between elliptical and lance-shaped, thin, serrated towards the point; roots solitary; fronds about half an inch long, reticulate, pellucid at the margin; leaf-stalks issuing from the sides of another leaf, from a fissure there; capsule egg-shaped, pointed, sitting on the upper surface of the frond; annual; flowers from June to September; occurs floating in ditches, pools and lakes; common.

L. MINOR, *Lesser Duckweed*: leaves inversely egg-shaped, serrated, compressed, the lower stalked; roots solitary; fronds two or three lines long, rather thick and firm; flowers from June to September; annual; occurs floating in dense masses, in ditches, pools and lakes; common.

L. GIBBA, *Gibbous Duckweed*: leaves inversely egg-shaped, hemispherical beneath; roots solitary; fronds about a line long, green and plane above, bulging and purple be-

neath; annual; flowers from June to September; occurs floating in ditches, pools and lakes.

L. POLYRHIZA, *Greater Duckweed*: leaves broadly egg-shaped, a little convex beneath; roots numerous; fronds half an inch long, firm, green above, purple below; annual; occurs floating in stagnant water; rare.

All the species of this genus are said to be eaten by ducks and other herbivorous aquatic birds.

LEONTODON. Dandelion. 19  
—1. Common calyx oblong, double, the inner of several linear, equal, parallel scales, the outer of fewer and shorter ones; compound corolla of very numerous, imbricated, equal, perfect, strap-shaped, abrupt, five-toothed florets; filaments hair-like, short; anthers united into a cylindrical tube; germen inversely egg-shaped, furrowed; style cylindrical, longer than the stamens; stigmas two, revolute; seed inversely egg-shaped, furrowed; seed-down in hair-like rays, on a long cylindrical stalk; receptacle naked, convex, dotted.

L. TARAX'ACUM, *Common Dandelion*: outer scales of the calyx loose and reflected; leaves runcinate, smooth; flowers large, yellow, a

single one on each tubular stalk; bitter, but not disagreeably so; perennial; flowers from March to August; grows in pastures, on banks, and by roads and walls; common.

**L. PALUSTRE, Marsh Dandelion :** outer scales of the calyx close-pressed and erect; leaves lance-shaped, between sinuate and toothed, nearly smooth; much smaller than the last, and perfectly distinct from it, its characters being permanent in every variety of situation; perennial; flowers in May and June; grows generally in marshy places, sometimes in dry pastures.

**LEONURUS. Motherwort. 14**  
—1. Calyx of one leaf, funnel-shaped, with five prominent angles, and five acute spreading teeth; corolla gaping; tube narrow, short; upper lip longest, concave, protuberant, rounded and undivided at the end, shaggy; lower lip reflected, deeply divided into three lance-shaped, nearly equal lobes; filaments much shorter than the corolla, covered by the upper lip; anthers oblong, compressed, cleft, covered with minute, globular, shining, hard dots; germen four-lobed, abrupt; style thread-shaped, incurved; stigma cleft, acute; seeds four, oblong,

abrupt, hairy, in the tube of the hardened calyx.

**L. CARDUACA, Common Motherwort :** stem-leaves lance-shaped, three-lobed; stem two or three feet high, minutely downy, acutely four-cornered; calyx stiff and sharp-bristled; corolla purplish, the upper lip white with erect hairs, the lower variegated. A common plant, growing among the rubbish of slovenly grounds, by walls, &c. It has a disagreeable, pungent smell, and bitter taste. An abominable decoction, or drench, is sometimes made of it, for colds, cramps, colics, &c., probably with the idea that these complaints will retire before it in disgust.

**LEPIDIUM. Pepperwort. 15.** Calyx of four egg-shaped, concave, deciduous leaves; petals inversely egg-shaped, undivided, with narrow claws; filaments awl-shaped, as long as the calyx; anthers two-lobed; germen roundish; style slender; stigma obtuse; silicle round or oblong, compressed, notched at the top, two-celled; the valves keel-shaped; partition very narrow, crossing the greater diameter of the pouch; seeds one in each cell, egg-shaped.

**L. VIRGINICUM, Wild Peppergrass :**

radical leaves pinnatifid; cauline leaves linear-lanceolate, remotely serrate; racemes terminal, naked; petals four; stamens two; silicle inversely heart-shaped; flowers small, white; July; height about ten inches; a common plant on hard soils by road-sides; smell and taste like the garden *Peppergrass*, *L. SATIVA*.

**LIGUSTICUM.** *Lovage.* 5—2. Flowers all perfect, fertile and regular; calyx superior, of five small, pointed, erect, permanent leaves, broad at the base; petals five, elliptical, flattish, with an inflexed point, their base narrow; filaments thread-shaped, spreading, shorter than the corolla; anthers roundish; germen oblong, abrupt, furrowed; styles at first short, erect, angular, swelled at the base, afterwards a little elongated, spreading; stigmas simple; fruit oblong, somewhat compressed, crowned with the calyx and styles; seeds oblong, each with five longitudinal wings.

*L. sco'ticum*, *Scottish Lovage*: leaves twice ternate; root fleshy, tapering; stem a foot high, striated, smooth; leaves stalked, the uppermost ternate, the leaflets broad, smooth, serrate, entire at the base, dark-green; flowers white, with a reddish tinge; the root is acrid, and

is occasionally chewed by the Herbridians as a substitute for tobacco. Perennial; flowers in July; grows on the sea-coast.

**LIGUSTRUM.** *Privet.* 2—1. Calyx inferior, tubular, with four upright, blunt teeth; corolla of one petal, funnel-shaped; limb expanded, divided into four deep, egg-shaped segments; stamens opposite, in the mouth of the tube; germen oval; style very short; stigma thick, cleft; berry globular, two-celled, with two seeds in each cell; seeds convex on one side, angular on the other.

*L. VULGARE*, *Common Privet*, *Prim* or *Print*: leaves between elliptical and lance-shaped, obtuse, with a small point; flowers in dense terminal panicles; a small shrub; leaves opposite, nearly sessile, dark-green, frequently remaining through the winter; flowers white, small; berries globular, black, bitter and nauseous. Flowers in June and July; grows in woods and among rocks.

**LILTIUM.** *Lily.* 6—1.

*L. CAROLINIANUM*, *Carolina Lily*: leaves nerveless, whorled, cuneate-lanceolate, scattered; flowers terminal, solitary, with revolute spotted petals; peduncles thick; stem

two feet high; flowers orange-color-



ed, thickly spotted with black. Found in the southern states.

**L. PHILADELPHICUM**, *Philadelphian Lily*: leaves whorled, linear-lanceolate; flowers open, erect; corolla campanulate, spreading; petals lanceolate, on long claws; stem five feet high; flowers light orange, spotted; July; grows in the low grounds; rare. A variety called the *Louisiana Red* has fine, spotted, scarlet-colored flowers. Found on dry soils, by road-sides, among bushes, &c.

**L. CANADENSE**, *Canadian Lily*,



*Yellow-spotted Lily*: leaves remotely whorled, linear-lanceolate; flowers

drooping, terminal; corolla revolute, campanulate; petals spreading; stem three or four feet high; flowers few, pendulous, of a brilliant yellow, spotted inside; June, July; perennial. This is the most brilliant ornament of our mowing grounds. It occurs generally in moist soils, but sometimes in rather dry pastures. By cultivation, this species has been known to reach seven feet in height.

**L. SUPERBUM**, *Superb Lily*: leaves linear-lanceolate, three nerved, glabrous, the lower ones whorled, upper ones scattered; flowers racemose, pyramidal, reflexed; corolla revolute; stem erect, straight, six feet high, supporting a most superb pyramid of light orange-colored flowers, sometimes to the number of forty. This species is sometimes seen in our gardens, improved by cultivation.

**L. CATESBEI**, *Catesby's Lily*: leaves scattered, linear-lanceolate; stem one-flowered; corolla erect; petals with long claws, wavy at the edges, reflexed at the ends; flowers orange; June, July. A small species, with a stem a foot high, found in the middle and southern states.

There are many other species of *lily*, mostly exotic, some of which



have been introduced into our gardens. But one or two, however, can compete with *L. superbum*. *L. tigrinum*, *Tiger-spotted Lily*, reaches the same height, with a pyramid of beautiful dark orange-colored, spotted flowers. *L. candidum*, *White Lily*, *L. Japonicum*, *Japan Lily*, and *L. longiflorum*, *Long-flowered Lily*, are universally esteemed for their beauty and fragrance. For these, we do not stand much indebted to the old continent, as all of our own species, described above, have been introduced into the gardens of Europe.

The pure whiteness of some species, and the splendid colors of others, have gained them a high distinction in proverb and song. As white as a lily is an old standard saying, and "Consider the lilies of the field, how they grow, they toil not, neither do they spin; and yet I say unto you, that even Solomon in all his glory was not arrayed like one of these"—is the most beautiful and striking allusion to the beauties of the field ever uttered.

**LINNÆA.** *Twin-flower.* 14—2. Calyx double; that of the fruit inferior, four-leaved, the inner leaves minute, acute, smooth, the two outer much larger, elliptical,

glandular; that of the flower superior, of one leaf, deeply divided into five erect, lance-shaped, acute, equal segments; corolla of one petal, bell-shaped, with the tube cylindrical, dilated upwards, about twice as long as the upper calyx, the limb divided into five nearly equal, spreading segments; filaments awl-shaped, arising from the base of the corolla, shorter than its limb; anthers oblong, compressed; germen globular, three-celled; style cylindrical, as long as the corolla, declining; stigma obtuse; berry dry, oblong, one-celled, invested by the lower calyx, and crowned by the upper; seed solitary, oblong.

*L. BORREALIS*, *Two-flowered Linnaea*, *Twin-flower*. The only species.



Root fibrous; stems prostrate and creeping, forming large patches; leaves opposite, stalked, egg-shaped, slightly hairy; flowering branches axillar, erect, bearing two pendulous whitish flowers; perennial; flowers in May and June. Grows in dry woods.

**LINARIA.** Toad-flax. 14—2. Calyx of one leaf, divided into five deep, oblong, permanent segments, the two lower more distant from each other; corolla gaping; tube oblong, tumid or elongated into a spur; upper lip cleft, reflected at the sides; lower lip obtuse, three-lobed, with an elevated palate, closing the mouth, and hollow beneath; filaments concealed by the upper lip; anthers approaching each other; germen roundish or egg-shaped; style thread-shaped, as long as the stamens; stigma obtuse; capsule roundish or oval, obtuse, two-celled; seeds numerous, roundish, or angular, attached to an oblong, cylindrical receptacle, in the middle of the partition.

**L. CANADENSIS,** *Canada Snap-Dragon*: leaves alternate, linear, remote, assurgent, smooth; flowers racemose; stem simple; runners procumbent; stem erect, slender, generally simple, about a foot high; racemes terminal; flowers small, blue; July, August; annual; grows by road-sides.

**L. ELA'TINE,** *Sharp-pointed Snap-Dragon*: leaves halberd-shaped, alternate, the lowest egg-shaped, opposite; stems procumbent, hairy; upper lip of the corolla yellow, low-

er lip edged with deep purple; annual; flowers from July to September; grows in corn-fields.

**L. VULGARIS,** *Yellow Toad-flax*: leaves between lance-shaped and linear, crowded; spikes terminal; flowers imbricated; calyx smooth, shorter than the spur; the whole plant smooth; stems two feet high, densely covered with narrow acute leaves, with a terminal dense spike of yellow flowers, having an orange-colored palate. A variety occurs with a regular five-cleft, five-spurred corolla. Perennial; flowers in July; grows by the edges of fields, road-sides, &c.

The name *Snap-Dragon* has been given to these plants on account of a peculiarity in the structure of the flower. The mouth of the corolla is closed by a palate protruding from the under lip, which springs downwards, opening the mouth, whenever the sides of the corolla are pressed inwards by the fingers.

**LINUM.** Flax. 5—5. Calyx inferior, of five lance-shaped, erect, permanent leaves, smaller than the corolla; petals five, oblong, obtuse, narrow below, moderately spreading; filaments five, awl-shaped, erect, as long as the calyx, and five shorter intermediate ones: anthers

arrow-shaped; germen egg-shaped; styles thread-shaped, erect, as long as the stamens; stigmas bluntish, spreading; capsule nearly globular, obscurely five-sided, ten-celled, ten-valved; seeds solitary, egg-shaped, acute, compressed, polished.

**L. VIRGINIANUM**, *Virginian Flax*: sepals acute, alternate; panicle terminal; leaves sessile, lanceolate, scattered, the radical ones ovate; stem erect, slender, about a foot high; flowers small, yellow; July; grows in woods; perennial.

This genus contains many species, the most important of which is *L. usitatissimum*, *Common Flax*, a well-known thread or clothing plant, which has been cultivated from the remotest antiquity for its cortical fibres, which, when separated and reduced, by the brake, from the woody stalk, and cleared from the coarse fibres, or tow, by hatchelling, is spun into thread for sewing; or yarn, for cloth. The tow is spun and woven into a coarse kind of cloth, or crash. The seeds furnish the well-known linseed oil, which has the property of drying quick, and on this account is used for mixing paints, printer's ink, &c.

**LIQUIDAMBER.** 21—7.

**L. STYRACIFLUA**, *Sweet Gum*:

leaves alternate, petiolated, five-lobed; recesses at the base of the veins villous. This tree is very



generally diffused throughout the United States, from Maine to Florida, to Illinois and Mexico.

In favorable situations it grows to the height of sixty feet, with a circumference of fifteen feet, at five feet from the ground. This tree is garnished with fine foliage, which changes to a dull red with the first autumnal frosts, and falls soon after. The shoots upon which the young leaves appear in the spring are smooth and of a yellowish-green color. The leaves vary in size from three to six inches, according to the vigor of the tree and to the situation of the leaf, and less deeply palmated on the lower branches; they are alternate, petiolated, and divided into five principal lobes; in this last particular they bear some resemblance to the leaves of the sugar maple, from which they differ in having the lobes deeper and more

regularly shaped, and being finely denticulated at the edge. In warm weather a viscous substance exudes from the leaves of such of those trees as grow upon dry grounds; when bruised, they exhale a sensible, aromatic odor. The barren and fertile flowers open in April, and are borne by different branches of the same tree. The fertile flowers are not conspicuous, and the barren ones are in oval aments an inch and a half in length. The fruit is globular and bristling with points; when arrived at maturity, it is about an inch and a half in diameter, and is suspended by a flexible pedicel, one or two inches long; the globes, which are green at first and afterwards yellow, are composed of a great number of closely connected capsules. At the beginning of autumn these capsules open and liberate the seeds, which are small, blackish, oblong, compressed and surmounted by a wing. Each capsule contains one or two seeds united with a great number of minute bodies incapable of germination, resembling oaken sawdust.

The trunk of the full-grown tree is covered with a deeply-furrowed bark, not unlike that of several species of oak. Sweet gums are found

of the same size on the same soil, some of which have a large proportion of sap and only five or six inches of heart, while others consist principally of perfect wood, with only a thin layer of sap. The heart is reddish, and when sawn into boards it is observed to be transversely marked at considerable distances with blackish belts. This wood is very compact and fine-grained, and is susceptible of a fine polish. Though inferior in strength to the oak, it suffices for many purposes which require great toughness and solidity. In some parts of the United States it is employed for the frames of wooden houses. As it furnishes boards two or three feet in width, it is sometimes sawn very thin and employed by cabinet-makers to line the inside of certain articles of mahogany furniture; it is also employed for bedsteads and for the balusters of stair-cases. It can only be advantageously employed in work that is sheltered from the air. In summer, upon cutting the live bark and at the same time slightly wounding the sap of this tree, a resinous substance of an agreeable odor distils in small quantities.

LIRIODENDRON. Tulip-tree.  
13—5.

*L. TULIPIFERA*, *Common Tulip-tree*: leaves truncate at the end,



with two broad, opposite stipules, six or eight inches broad, on long petioles, alternate, somewhat fleshy, smooth; flowers greenish yellow, fragrant. For size and beauty, this is one of the finest trees of our forests. It is met with in the Atlantic states, from Massachusetts to Carolina, but is more abundant further west.

In the Atlantic states, especially at a considerable distance from the sea, tulip-trees are often seen seventy, eighty, and one hundred feet in height, with a diameter of eighteen inches to three feet. But the western states appear to be the natural soil of this magnificent tree, and here it displays its most power-

ful vegetation. M. Michaux mentions a tulip-tree, near Louisville, on the Ohio, which at five feet from the ground was twenty-two feet six inches in circumference, and whose elevation he judged to be from one hundred and twenty to one hundred and forty feet. Of all the trees of North America with deciduous leaves, the tulip-tree, next to the button-wood, attains the amplest dimensions; while the perfect straightness and uniform diameter of the trunk for upwards of forty feet, the more regular disposition of its branches, and the greater richness of its foliage, give it a decided superiority over the button-wood, and entitle it to be considered as one of the most magnificent vegetables of the temperate zones. The flowers bloom in June or July. They are large, brilliant, and on detached trees very numerous, variegated with different colors, among which yellow predominates; they have an agreeable odor, and, surrounded by luxuriant foliage, they produce a fine effect. The fruit is composed of a great number of thin, narrow scales, attached to a common axis, and forming a cone two or three inches in length. Each cone consists of sixty or seventy seeds, of

which never more than a third part are productive. For ten years before the tree begins to yield fruit, almost all the seeds are unproductive, and on large trees, those from the highest branches are the best.

The bark of this tree, till the trunk exceeds seven or eight inches in diameter, is smooth and even; it afterwards begins to crack, and the furrow and the thickness of the bark are proportioned to the size and to the age of the tree. The heart of the perfect wood is yellow, approaching to a lemon color, and its alburnum is white. Though this tree is classed as a light wood, it is much heavier than the poplars; its grain is equally fine and more compact, and the wood is easily wrought and polishes well. It is found strong and stiff enough for uses that require great solidity. The heart, when separated from the sap and perfectly seasoned, long resists the influence of the air, and is said to be rarely attacked by worms. Its greatest defect, when employed in wide boards, and exposed to the weather, is its liability to shrink and warp by the alternations of dryness and moisture; but this defect is in a great measure compensated by its other properties.

In many parts of the United States it is employed for constructing the frames of houses and for shingles, and is considered as the best substitute for the pine, red cedar and the cypress. It is also sawn into boards, of which are made the panels of doors and of wainscots, and the mouldings of chimney-pieces; they are exclusively used for the panels of coaches and chaises. When perfectly dry, they receive paint well, and admit of a brilliant polish. A large quantity of this wood is likewise employed in the manufacture of trunks and of bedsteads; as it is easily wrought in the lathe, and is very light, it is much used for wooden bowls. It is also employed for the rails of rural fence, for the construction of bridges, and for the felloes of large mill wheels. It affords excellent charcoal, which is employed by smiths in districts that furnish no fossil coal.

LITHOSPERMUM. Gromwell.

5.—1. Calyx inferior, of one leaf, oblong, deeply five-cleft, segments acute, equal, nearly erect; corolla of one petal, funnel-shaped; tube open; filaments very short; anthers oblong, concealed in the tube; germs four; style thread-shaped, shorter than the tube; stigma ob-

tuse, notched ; seeds four, egg-shaped, pointed, hard.

*L. OFFICINALE*, *Common Gromwell*, *Graymill* : corolla little longer than the calyx ; leaves lance-shaped, rather acute ; root tapering, whitish ; stem about two feet high ; leaves grayish-green ; corolla pale yellow ; perennial ; flowers in June ; grows in dry gravelly places ; common.

*L. ARVENSE*, *Corn Gromwell* : corolla little longer than the calyx ; leaves narrow, lance-shaped, obtuse ; root tapering, with a purplish-red bark ; stem about a foot high ; leaves bright green ; corolla white ; annual ; flowers in June ; grows in corn-fields and waste places.

*L. MARITIMUM*, *Sea Gromwell*, *Sea Bugloss* : leaves egg-shaped, sprinkled with callous dots ; stems all procumbent ; root fleshy, tapering ; stems numerous, from one to two feet long ; leaves somewhat fleshy, smooth ; flowers in terminal leafy clusters ; corolla twice as long as the calyx, of a beautiful purple ; perennial ; flowers in July and August ; grows on gravelly beaches.

*LOBELIA*. 5—1. Calyx superior, of one leaf, deeply divided into five small, nearly regular, permanent segments ; corolla of one petal, irregular ; tube cylindrical, split

along the upper side ; limb deeply divided into five lance-shaped segments, the two upper small, forming the upper lip, the others more spreading and forming the lower lip ; filaments awl-shaped, as long as the tube, united at the top ; anthers united into a cylinder ; germs pointed ; style cylindrical, as long as the stamens ; stigma knobbed, hairy ; capsule elliptical, angular, with two or three cells, and as many valves, open at the top ; partitions contrary to the valves ; seeds numerous, minute, covering a conical receptacle.

*L. DORTMANNA*, *Water Lobelia* : leaves linear, entire, with two longitudinal cells ; stem nearly leafless ; leaves numerous, mostly from the root ; stem solitary, erect, hollow, slightly leafy, terminating in a loose cluster of pale blue, drooping flowers ; perennial ; flowers in July ; grows in ponds, the flowers rising above the water.

*L. CARDINALIS*, *Scarlet Cardinal Flower* : leaves oblong, lanceolate, serrate, erect ; raceme terminal, one-sided, leafy ; stem erect, leafy, simple, two or three feet high ; flowers large, bright scarlet ; July to September ; perennial. This is one of our most splendid native

plants; it has been introduced into the gardens of Europe, where it is very popular. It grows in meadows, and frequently in gravelly soils by the sides of brooks and ponds. Poisonous.

*L. SIFILITICA*, *Blue Cardinal Flower*: leaves oblong-lanceolate,



acute at each end, unequally serrated; flowers axillary, solitary; recesses of the calyx reflexed; stem simple, rough with short hairs, about two feet high; flowers in July; perennial. This plant was once in some repute in medicine, but has lost its popularity.

*L. KAL'MII*, *Kalm's Lobelia*: stem slender, erect, simple, about a foot high; radical leaves spatulate; cauline leaves linear-lanceolate, obtuse, entire, or slightly toothed;

raceme terminal; flowers alternate, remote, pedicelled; flowers blue; July.

*L. INFLATA*, *Indian Tobacco*: stem erect, branching, rough with short hairs, twelve or fifteen inches high; leaves toothed, serrate, the lower ones ovate-oblong, upper ones ovate; peduncles axillary, one-flowered; capsules inflated; flowers pale blue; June, July; annual; grows in dry places in fields and by road-sides. Every part of the plant is a violent emetic, particularly the seeds, proving the strength with painful retchings, producing spasms, and in many instances death.

This is the plant which forms the grand *universal elixir vite* of the Thomaonian practitioners, or *steam doctors*. The practice of these quacks is painful and disgusting to contemplate, but should be as generally known as possible, that those who wish to make trial of it may do so with their eyes open. After the strength of the patient is exhausted by *steaming* and a painful and dangerous operation upon the lower regions of the bowels, he is put in a warm bed, and thickly covered with blankets. Three doses of lobelia are then successively administered, at intervals of about



fifteen minutes, each dose consisting of about two thirds of a pint of warm water, thickened with the pulverized stems, leaves and seeds, to the consistence of thick gruel, or rather a *thin pudding*. The operation generally follows in about half an hour; but if the constitution of the sufferer resists the nauseous mixture longer than usual, another measure of lobelia is given; the doses being, as the botanists say, ternate, twice-ternate, and perhaps thrice-ternate. If the patient survives, the process ends with another steaming, and the payment of five dollars.

A case in which the famous *Doct. Thomson* himself effectually put an end to the sufferings of his patient, and for which he was afterwards tried for murder, is noticed in *Bigelow's Medical Botany*. A history of the same case is also given in the *Doctor's history of his own life and usefulness*. In the same book he also details another fatal case, in which he ascribes the death of his patient to *witchcraft*.

LUPINUS. Lupine. 17—4.

L. PERENNIS, *Common Lupine*: calyxes alternate without appendages, upper lip emarginate, lower entire; stem erect, soft, hairy; leaves soft, slightly hairy, digitate, on

long flexible foot-stalks; segments eight or ten, lanceolate-wedge-shaped, arranged about the end of the petiole-like rays; spike terminal;



flowers blue, sometimes varying in different plants to nearly white; May, June; found most abundant in sandy woods. In such situations, when the ground has been recently cleared, burnt, and sown with grain, the crop is sometimes succeeded by a growth of lupines, which cover the whole field with one entire sheet of flowers. It is a beautiful plant, and has been introduced into our gardens and those of Europe. A species from Nootka Sound, with purple flowers, is also cultivated, and reaches the height of six feet.

LU'ZULA. 6—1. Calyx inferior, of six oblong, acute, permanent leaves, three of them internal; corolla none; filaments thread-like, short; anthers oblong, erect, two-

celled; germen superior, triangular; style simple, thread-shaped, short; stigmas three, tapering, downy; capsule triangular, one-celled, three-valved; seeds three, at the bottom of the capsule.

*L. FILOSA, Broad-leaved Hairy Wood Rush:* panicle cymose, wide-



ly spreading; flowers solitary; capsule pointless; leaves of the calyx long-pointed, shorter than the capsule; culm about a foot high; leaves between linear and lance-shaped, ribbed, fringed with long, white hairs; perennial; flowers in May; grows in woods and thickets.

*L. CAMPESTRIS, Field Rush:* panicle of three or four egg-shaped, dense clusters; capsule inversely egg-shaped, obtuse, with a small point; leaves of the calyx long-pointed, longer than the capsule; root scaly, creeping, tufted; culm from three to ten inches high, simple, straight; leaves dark green, very

hairy at the margin; leaves of the calyx lance-shaped, pointed, dark-brown; perennial; flowers in May; grows in dry pastures.

*L. SPICATA, Spiked Wood Rush:* panicle compound, dense, oblong, drooping; capsule elliptical, with a small point; leaves of the calyx between taper-pointed and awned, as long as the capsule; from six to eight inches high; leaves small, somewhat channelled, hairy at the margins of the sheaths; perennial; flowers in July.

**LYCOP'SIS.** Wild Bugloss. 5  
—1. Calyx inferior, of one leaf, deeply five-cleft; corolla of one petal, funnel-shaped, tube twice bent, mouth closed with five rounded, hairy valves; filaments very small; anthers oblong; germens four; style thread-shaped, short; stigma blunt, notched; seeds four, egg-shaped, cornered.

*L. ARVEN'SIS, Small Bugloss:* leaves spear-shaped, waved, very bristly; the whole plant very rough and bristly; stems erect, roundish, about a foot high; corolla sky-blue, with white valves; annual; flowers small; June and July; grows in corn-fields and by road-sides.

**LYCOPUS.** Water Horehound.  
2—1. Calyx tubular, with five

acute segments; corolla tubular, with four segments, the upper broader and notched; stamens simple, longer than the corolla, bent; anthers small; germen four-cleft; style thread-shaped, as long as the stamens; stigma cleft; seeds four, inversely egg-shaped; at the bottom of the calyx.

*L. EUROPE'US*, *Water Horehound*, *Gipsywort*: leaves deeply serrate; two feet high; allied to the genus *Mentha*, &c., and like it having a four-cornered stem; leaves opposite, narrow, egg-shaped, wrinkled, very deeply serrated; flowers whitish, in dense whorls; perennial; flowers from July to September; grows on the banks of ponds and brooks in gravelly soil. This plant dyes black, and gives a permanent color to linen, wool and silk. The gipsies of Europe are said to stain their skin with it.

*L. VIRGINICUS*, *Virginian Water Horehound*, *Bugle Weed*: leaves opposite, lanceolate, the lower pinatifid at base, upper remotely serrated; stem squarish, smooth; flowers purplish white, in small whorls; stem two or three feet high; flowers in July, August; perennial; grows in wet places.

*LYSIMACHIA*. Loose-strife. 5

—1. Calyx inferior, of one leaf, deeply divided into five acute segments; corolla of one petal, wheel-shaped, without a tube, the limb divided into five egg-shaped segments; filaments awl-shaped; anthers oblong, notched at both ends; germen roundish; style thread-shaped, as long as the stamens; stigma obtuse; capsule globular, pointed, one-celled, ten-valved; seeds numerous, angular.

*L. THYSIFLO'RA*, *Tufted Loose-strife*: clusters lateral, stalked; root



creeping; stems two feet high, erect, simple; leaves numerous, opposite, sessile, lance-shaped; flowers small, yellow; perennial; flowers in July; grows in watery places.

*L. CILIA'TA*, *Heart-leaved Loose-strife*: leaves opposite, on long stalks, cordate-ovate; petioles ciliated; flower-stalks axillary, in pairs; flower drooping; corolla shorter than the calyx; petals even; stem about two feet high; flower yellow;

June, July; perennial; grows on beaches.

**LYTHRUM.** 11—1. Calyx inferior, of one leaf, cylindrical, with twelve marginal divisions, alternately smaller and larger; petals six, oblong, equal, with short claws, inserted into the calyx; filaments thread-like, shorter than the corolla, six alternate ones shorter; anthers roundish, incumbent; germen superior, oblong; style thread-like, as long as the stamens, a little curved; stigma knobbed; capsule oblong, membranous, two-celled, pointed, inclosed in the tube of the calyx; seeds numerous, oblong, minute.

**L. SALICARIA,** *Milk Willow-herb*: leaves opposite, lance-shaped, heart-



shaped at the base; flowers in whorled leafy spikes; stem erect, square, from two to four feet high; flowers purplish-red, forming a very beautiful showy spike; perennial;

flowers in July and August; grows in watery places.

**L. HYSSOPIFOLIUM,** *Grass-poly*: leaves alternate, narrow lance-shaped; flowers axillary, solitary; stamens six; stems decumbent, one of them erect; flowers small, pale purple; annual; flowers in August; grows in wet places, the dried beds of ponds, &c.

M.

**MAGNOLIA.** 13—5.

**M. GRANDIFLORA,** *Laurel-leaved Magnolia*, *Big Laurel*: leaves ever-



green, oval-oblong, coriaceous, shining above, ferruginous beneath; flowers erect, with from nine to twelve petals. Of all the trees of North America east of the Mississippi, the big laurel is the most

remarkable for the majesty of its form, the magnificence of its foliage, and the beauty of its flowers. It abounds in the southern states.

The big laurel claims a place among the largest trees of the United States. It sometimes, though rarely, reaches ninety feet in height, and two or three feet in diameter; but its ordinary stature is from sixty to seventy feet. Its trunk is nearly straight, covered with a smooth grayish bark, resembling that of the beech, and its summit nearly in the shape of a regular pyramid. Its leaves are entire, oval, sometimes acuminate and at others obtuse at the summit, six or eight inches long, and borne by short petioles. They are evergreen, thick, coriaceous, and very brilliant on the upper surface. The flowers are white, of an agreeable odor, and from seven to twelve inches broad. They are larger than those of any other tree of the American forests, and on detached trees they are commonly very numerous. Blooming in the midst of rich foliage, they produce so fine an effect, that those who have seen the tree on its native soil agree in considering it as one of the most beautiful productions of the vegetable kingdom. In Carolina,

its flowers put forth in the month of May, and are succeeded by fleshy, oval cones, about four inches in length, which are composed of a great number of cells. At the age of maturity, which is about the first of October, they open longitudinally, showing two or three seeds of a vivid red. The seeds soon after quit their cells, and for some days remain suspended without, each by a white filament attached to the bottom of the cell. The red, pulpy substance which surrounds the stone decays, and leaves it naked. The stone contains a white, milky kernel.

The wood of the big laurel is soft, and remarkable for its whiteness, which it preserves even after it is seasoned. It is said to be easily wrought and not liable to warp, but not durable when exposed to the weather: for this reason the boards are used only in joinery in the interior of buildings. In trees from fifteen to eighteen inches in diameter, there can be discerned no mark of distinction between the sap and the heart of this wood, except a deep, brown point, six or eight lines in diameter, in the centre of the trunk.

M. GLAUCA, *White Bay, Small*

*Magnolia*. This tree, though inferior in size to the big laurel, and less regularly formed, is interesting on account of its beautiful foliage and flowers. It is common in Gloucester, Massachusetts, and in Lower Jersey, and becomes more so in proceeding towards the south. In the maritime part of the south-



ern states, in the Floridas and in Lower Louisiana, it is one of the most abundant among the trees which grow in wet grounds. It is found not far in the interior of the country, and in New York, Pennsylvania and Maryland it disappears thirty or forty miles north of the capitals of these states. In the Carolinas and Georgia, it grows only within the limits of the pine-barrens. In Philadelphia and New York and their vicinity, this tree is called *Magnolia*, which denomina-

tion has entirely superseded those of *Swamp Sassafras* and *Beaver Wood*, which were in use among the Swedish settlers who first fixed themselves in the country. In the southern states it is generally called *White* or *Sweet Bay*. It grows most abundantly in swamps and marshes composed of a black and miry soil.

This tree sometimes rises to the height of forty feet, with a diameter of twelve or fourteen inches; but it does not ordinarily exceed twenty-five or thirty feet, and it often fructifies at the height of five or six feet. The bark of this tree is smooth and grayish, and its trunk is always crooked, and divided into a great number of divaricating branches. The leaves are five or six inches long, petiolated, alternate, oblong-oval and entire. They are of a dark, shining green above, and glaucous beneath, thus presenting an agreeable contrast in the color of the two surfaces. The leaves fall in autumn, and are renewed early in the following spring. The flowers, which are single and situated at the extremity of the branches, are two or three inches broad, white, and composed of several concave, oval petals. Near Charleston in South Carolina, this tree blossoms in May, and

a month later in the neighborhood of Philadelphia and New York. The fruit is small, green and conical, composed of a great number of cellules, and varying in length from an inch to an inch and a half. When ripe, the seeds, which are of a scarlet color, burst their cells, and remain some days suspended without, by white, lax, slender filaments.

The wood of this tree, which is of a white color and very light, is employed for no use in the arts. The bark of the roots has an aromatic odor and a bitter taste. Some of the inhabitants drink an infusion of it in brandy, as a slight sudorific, for rheumatic affections. They also steep the cones in spirituous liquor, which renders it very bitter; they regard it as a preservative against autumnal fevers.

M. ACUMINATA, *Cucumber Tree*. In all parts of the United States where this tree is found, it is known only by the name of *Cucumber Tree*. It is a beautiful vegetable, equal in height and diameter to the big laurel. The most northern point at which this tree grows is near the falls of Niagara, in latitude forty-three degrees. It abounds along the whole tract of the Alleghanies, to their termination in Georgia,

over a distance of nine hundred miles. It is also found on the Cumberland mountains. The situations peculiarly adapted to its growth are the declivities of mountains, narrow valleys and the banks of torrents, where the air is constantly moist, and where the soil is deep and fertile.

The cucumber tree sometimes exceeds eighty feet in height, with a diameter of three or four feet. The trunk is perfectly straight, of a uniform size, and often destitute of branches for two thirds of its length. The summit is ample and regularly shaped, and the tree is one of the finest in the American forests. The leaves are six or seven inches long, and three or four inches broad, upon old trees; upon saplings growing in moist places they are sometimes twice as large. Their form is oval, entire and very acuminate; they fall in the autumn and are renewed in the spring. The flowers open in May, and are five or six inches in diameter, bluish, and sometimes white with a tint of yellow. They have a feeble odor, but as they are large and numerous, they have a fine effect in the midst of the superb foliage. The cones or fruit are about three inches long, and eight

or ten lines in diameter, of a nearly cylindrical shape, and often a little larger at the summit than at the base. They are convex on one side and concave on the other, and when green they nearly resemble a young cucumber, whence the tree has derived its name. The cells are arranged as in the other species of the genus, and each of them contains one rose-colored seed, which, before it escapes, remains suspended like those of the great and small laurels.

On old stocks the bark of this tree is grayish and deeply furrowed. The perfect wood is soft and of a yellowish brown color; it is fine-grained and susceptible of a brilliant polish. Being a rare tree, it is only accidentally employed in the arts. Sawn into boards, it serves in joinery for the interior of wooden houses, and, for its size and lightness, it is selected for large canoes. Most of the inhabitants of the country bordering on the Alleghanies gather the cones of this tree about midsummer, when they are half ripe, and steep them in whiskey: a glass or two of this liquor, which is extremely bitter, they habitually take in the morning, as a preservative against autumnal fevers.

*M. CORDATA, Heart-leaved Cucumber Tree.* This magnolia is found on the banks of the rivers of Georgia and South Carolina. It is forty or fifty feet in height and ten or twelve inches in circumference. Its trunk is straight, and covered with a rough and deeply furrowed bark, very much resembling that of the sweet gum and that of the young white oak. Its leaves, which are borne upon long petioles, are from four to six inches in length, from three to five inches wide, smooth and entire. The flowers, which appear in April, are yellow, with the interior of the petal longitudinally marked with several reddish lines. The flowers, though somewhat smaller than those of the cucumber tree, are nearly four inches in diameter. The cones are about three inches long, and ten or twelve lines in thickness, of a cylindrical form, and of a similar construction to those of the other magnolias. The seeds also are similar in color and arrangement.

The wood of this tree resembles, in every respect, that of the cucumber tree; from its softness and readiness to decay, it is not employed for any determinate use.

*M. TRIFIDATA, Umbrella Tree.*



The umbrella tree is first seen in the southern part of the state of New York; but it is more multiplied farther south, and is common on some of the islands in the river Susquehannah, and still more so in the southern and western states. It is found in the maritime parts of the Carolinas and of Georgia, and three hundred miles from the sea, on that part of the Alleghanies which traverses these states. The forests which cover the banks of the river Notahaky, in East Tennessee, may be particularly mentioned as abounding in the umbrella tree. It appears only in situations perfectly adapted to its growth, which are always shady, and where the soil is deep, strong and fertile.

The dimensions of the umbrella tree are such as to form a connecting link between the large shrubs and trees of the third order; for though it sometimes rises to the height of thirty or thirty-five feet, with a diameter of five or six inches, it rarely attains this size. Its leaves, which are thin, oval, entire, and acuminate at both extremities, are eighteen or twenty inches long, and seven or eight inches broad; they are often disposed in rays at the extremity of vigorous shoots,

and thus display a surface of thirty inches in diameter; whence is derived the name of *Umbrella Tree*. The flowers open in May or June, and are seven or eight inches in diameter, white, composed of several oblong, concave petals, and situated at the extremity of the branches; they are beautiful, though less regularly shaped and of a less agreeable odor than those of the other species of magnolia. The conical fruit is four or five inches long, and about two inches in diameter; it ripens about the first of October, and is of a beautiful rose color, with seeds of a pale red.

The wood of this tree is soft, porous and unfit for use. The bark on the trunk is gray, smooth and polished: if cut while green, it exhales a disagreeable odor.

*M. AURICULATA*, *Long-leaved Cucumber Tree*. This species of magnolia is remarkable for the beauty of its foliage, and for the size of its flowers and the fragrance of their odor. It appears to be particularly confined to that tract of the Alleghanies which traverses the southern states, at the distance of nearly three hundred miles from the sea. It is however sometimes found on the steep banks of the rivers which

rise in these lofty mountains, and which on one side roll their waters to the sea, and on the other flow to meet the Ohio, after traversing Kentucky and Tennessee. It is profusely multiplied on the steepest part of the Great Father mountains, Black and Iron mountains of North Carolina. It is designated by the names of *Long-leaved Cucumber Tree*, and of *Indian Physic*.

This tree grows to the height of forty or forty-five feet, with a diameter of twelve or fifteen inches. Its trunk is straight and well-shaped, and often undivided for half of its length; its limbs, widely spread



and sparingly ramified, give to this tree, when stripped of its leaves, so peculiar an air that it is readily distinguished. The leaves are of a

light green color, of a fine texture, eight or nine inches long, and from four to six inches broad; on young and vigorous trees they are often one third or even one half longer. They are smooth on both surfaces, acuminate at the summit, widest near the top and narrowest towards the bottom. The base is divided into rounded lobes, whence is derived the specific name of *auriculata*. The flowers are three or four inches in diameter, of a fine white color, of an agreeable odor, and situated at the extremity of the young shoots, which are of a purplish red dotted with white. The flowers open in April or May, and are succeeded by oval cones, three or four inches long, and, like those of the umbrella tree, of a beautiful rose color when ripe. Each cell contains one or two red seeds.

The wood of this tree is soft, spongy, very light, and unfit for use. The bark is gray, and always smooth even on the oldest trees. When the epidermis is removed, the cellular integument, by contact with the air, instantly changes from white to yellow. The bark has an agreeable aromatic odor, and an infusion of it in some spirituous liquor is employed as a sudorific in rheumatic affections.

**M. MACROPHYLLA**, *Large-leaved Umbrella Tree*. This magnolia is the least multiplied of the American species, and is rarely met with in the forests. It is found in small quantities on the mountains of North Carolina. West of the range, in Tennessee, it is more common, but even here only a few trees are found together, at intervals of forty or fifty miles. It delights in cool situations sheltered from the wind, where the soil is deep and fertile.

The large-leaved umbrella tree arrives at the height of thirty or thirty-five feet, with a diameter of four or five inches. The trunk is covered with a very smooth, white bark, by which, in the winter, when stripped of its leaves, it is readily distinguished from the umbrella tree. At this season it differs from the umbrella tree also in its buds, which are compressed instead of being rounded at the end, and which are covered with a soft and silvery down. Of all this genus, this tree bears the largest leaves; some of them are thirty-five inches long and nine or ten inches broad. They are borne on petioles, short in comparison with the size of the leaves, and are of an oblong shape, pointed at the extremity, and cordiform at the

base: the color is light green above, and glaucous beneath; they fall in the autumn, and reappear early in the spring. The flowers are white, and when full-blown are sometimes eight or nine inches in diameter: they are composed of six petals, longer and broader than those of the umbrella tree. Within the flower, near the bottom of the petals, is a purple spot seven or eight lines in diameter. The flowers diffuse a fragrant odor, and their beauty is heightened by the luxuriant foliage which surrounds them. They bloom in June or July, and are succeeded by cones about four inches long, nearly cylindrical, and of a vivid rose-color when arrived at maturity. In the arrangement of the cells and of the seeds, they resemble those of the umbrella tree and of the long-leaved cucumber tree.

The wood of this tree is softer and more porous than that of the umbrella tree, and is of no value in the arts.

The different species of magnolia are all natives either of Asia or America. The American are superior to the Asiatic in the beauty of their foliage, and on this account have been preferred and highly esteemed in Europe as ornamental

trees and shrubs for near a century. *M. glauca* was introduced into England nearly one hundred and fifty years ago. It is impossible for those who have not witnessed it, to imagine the beauty and magnificence of some of the southern swamps when these trees are in bloom; the whole forests seem covered with their flowers, and the atmosphere filled with their fragrance.

**MAL'VA.** Mallow. 16—7. Calyx inferior, double, permanent, the outer smaller, of three egg-shaped, acute leaves, the inner of one leaf, divided half-way into five broad segments; petals five, inversely heart-shaped, abrupt, flat, their claws attached to the tube formed by the stamens; filaments numerous, hair-like, united below into a tube; anthers kidney-shaped; germs round, depressed; style cylindrical; stigmas numerous, bristle-shaped, nearly as long as the style; capsules numerous, compressed, arranged in a circle round the columnar receptacle, each two-valved and one-celled; seeds solitary, kidney-shaped.

*M. ROTUNDIFOLIA*, Dwarf Mallow, Round-leaved Mallow: stem prostrate; leaves roundish-heart-shaped,

obtusely five-lobed; fruit-stalks bent downwards; stems numerous, lying



flat on the ground; flowers pale lilac; perennial; flowers from June to September; grows in waste ground and by waysides. The leaves of this plant are very delicate and beautiful. The mucilaginous seed-vessels are sometimes sought and eaten by children, who dignify them by the name of *cheeses*. "The leaves of Mallows are good against the stinging of Scorpions, Bees, Wasps, and such like: and if a man be first anointed with the leaves stamped with a little oil, he shall not be stung at all, as Dioscorides saith."

*M. CAROLINIANA*: leaves five-lobed or palmate, notched and toothed; peduncles longer than the petioles; petals entire; fruit villous; root perennial; stem prostrate, branching, a little hairy; leaves alternate, very obtuse or cordate at base, three to five-lobed, with the lobes variously dissected, a little hairy; flowers axil-

lary, solitary; peduncles about an inch long; petals five, spatulate, nearly round at the summit, red; stameniferous column short; anthers twelve to fifteen; May, June; grows about buildings in rich soils.

**MENTHA.** Mint. 14—1. Calyx of one leaf, tubular, erect, with five nearly equal, marginal teeth; corolla straight, funnel-shaped, a little longer than the calyx; limb deeply divided into four nearly equal segments, the upper slightly notched; filaments awl-shaped, straight, distant, arising from the throat of the corolla; anthers two-lobed; germen superior, four-lobed; style thread-shaped, erect; stigma protruded, divided into two sharp, equal, spreading segments; seeds four, small, in the bottom of the calyx.

**M. VIRIDIS,** *Spear Mint*: spikes elongated, interrupted; leaves lance-shaped, acute, naked, sessile; bractees linear; flower-stalks smooth; stems two or three feet high, erect, branched, acutely four-cornered, smooth; spikes paniced, elongated, acute, the whorls of pale purple flowers a little distant. All the species of mint have a strong aromatic smell, but the properties of this being more agreeable than those of the others, it has been pre-

ferred, and is employed for culinary and medicinal purposes. Perennial; flowers in August.

**M. ARVENsis,** *Corn Mint*: flowers in whorls; leaves stalked, egg-



shaped; stem branched, spreading; calyx bell-shaped, covered with spreading hairs; pale green, hairy; stems from six inches to a foot long, generally decumbent; leaves serrate; flowers pale purple.

**M. BORRA' LIS,** *Horse Mint*: stem ascending, square, pubescent, about six inches high; leaves petioled, oval-lanceolate, acute, with resinous dots at each end; flowers in whorls; stamens projecting; flowers pale purple; June, July; perennial. Grows in moist places, by brooks and ditches.

**MENYANTHES.** Buck-bean. 5—1. Calyx inferior, of one leaf, deeply divided into five segments, permanent; corolla of one petal, with a short tube, and a limb divided into five recurved segments, covered above with long thread-like

fibres; filaments awl-shaped, short; anther cleft at the base; germen conical; style cylindrical; stigma notched; capsule egg-shaped, one-celled, two-valved; seeds numerous, attached to the margins of each valve.

*M. TRIFOLIA'TA*, *Marsh Trefoil*, *Buck-bean*: leaves ternate; disk of



the corolla shaggy; root large, black, creeping; stems round; leaves ternate on round footstalks; clusters stalked, opposite the leaves; corolla flesh-colored, the filaments white. This beautiful plant is possessed of powerful medicinal properties; an infusion of the leaves is extremely bitter, and is prescribed in rheumatisms and dropsies. Grows in marshes near ponds, brooks, &c.

*MENZIESIA*. 6—1. Calyx inferior, of one leaf, four-cleft or five-

cleft, permanent; corolla of one petal, inflated, deciduous; limb divided into four or five spreading segments; filaments eight or ten, thread-shaped, shorter than the corolla; anthers oblong, cleft at the base; germen superior, roundish; style angular, erect; stigma obtuse, with four or five notches; capsule oblong, with four or five valves and cells; partitions double, formed by the inflected edges of the valves; seeds numerous, small, oblong.

*M. CÆRULEA*, *Mountain Heath*, *Purple Menziesia*: leaves linear, obtuse, with cartilaginous teeth; flowers five-cleft, decandrous; stem four or five inches high, decumbent below, leafy above; flowers four or five, at the top of the highest branch, drooping; corolla pale purple; a shrub; flowers in June and July. Grows on the summits of some of our northern mountains. This beautiful little shrub resembles a heath in its foliage and flowers.

*MESPILUS*. Medlar. 12—1.

*M. ARBOREA*, *June Berry*. With the exception of the maritime parts of the Carolinas and of Georgia, this tree is spread over the whole extent of the United States and of Canada; but it is most multiplied upon the Alleghany mountains, and upon the

elevated banks of the rivers which flow from them. In the northern section of the Union, it is called *Wild Pear Tree* and *Sugar Plum*, and in the middle states *June Berry*.

The greatest height of this tree does not exceed thirty-five or forty feet, with a diameter of ten or twelve inches. Its trunk is covered with a bark resembling that of the cherry tree. The leaves are two or three inches long, and alternately arranged. When beginning to open they are covered with a thick, silvery down, which disappears with their growth, and leaves them perfectly smooth on both sides. They are of a lengthened oval shape, of a delicate texture, and finely denticulated. The flowers, which are white and pretty large, are disposed in long panicles at the summit of the branches; they blow in the beginning of April, and are succeeded by small fruit of a purplish color and of an agreeable, sweet taste. This fruit is ripe in the beginning of June, before that of any other tree or shrub.

The wood of the June berry is of a pure white, and exhibits no difference between the heart and the sap; it is longitudinally traversed by small, bright, red vessels, which

intersect each other and run together. It is applied to no particular use in the arts.

**MIMULUS.** Monkey-Flower. 14—2.

**M. RINGENS,** *Gaping Monkey-Flower*: leaves opposite, lanceolate,



acuminate, serrate, smooth, sessile; peduncles axillary, longer than the flower, curving upwards; calyx tubular, five-toothed; upper lip of the corolla turned back at the sides, lower lip three-lobed; stem one or two feet high, erect, smooth; flowers light purple; July, August; perennial. Grows in wet places.

This genus derived its name from the appearance of the flower-seeds, which are fancied to resemble the face of a grinning monkey.

**MORUS.** Mulberry. 21—4.

**M. RUBRA,** *Red Mulberry*: leaves cordate, ovate, acuminate or three-lobed, equally serrate, scabrous, soft beneath; female spikes cylindrical.

This tree is found in the northern, but is most abundant in the middle and western states.

In situations favorable to its growth, it attains the elevation of sixty or seventy feet, with a diameter of two feet. Its leaves are large, and sometimes entire, and at others divided into two or three lobes, rounded, cordiform and denticulated, of a dark green color, a thick texture, and a rough, uneven surface. The sexes are usually separate, though they are sometimes found upon the same tree. The male flowers form pendulous, cylindrical aments, about an inch in length; the female blossoms are small and scarcely apparent; the fruit is of a deep red color, an oblong form, and an agreeable, acidulous, sugary taste; it is composed by the union of a great number of small berries, each of which contains a minute seed.

The trunk of the red mulberry is covered with a grayish bark, more furrowed than that of the oaks and the hickories. The perfect wood is of a yellowish hue, approaching to lemon color. The concentric circles are distant and distinct; the wood is, nevertheless, fine-grained and compact, though

lighter than that of the white oak. It possesses strength and solidity, and, when perfectly seasoned, it is almost as durable as the locust, to which, by many persons, it is esteemed perfectly equal. At Philadelphia, Baltimore, and in the more southern ports, as much of it as can be procured is employed for the upper and lower parts of the frame of vessels, for the knees, the floor timbers, and, in preference to every other wood, except locust, for trunnels. In South Carolina it is selected for the ribs of large boats. For posts it is almost as durable and as much esteemed as the locust. As the leaves of this species are thick, rough and hairy while young, they are improper for the food of silk-worms, which feed with advantage only on the smooth, thin and tender foliage of the white and Chinese mulberry.

*M. alba*, *White Mulberry*, and *M.*



*ni'gra*, *Black Mulberry*, the former



originally from China, and the latter from Italy, have been introduced. *M. alba* begins to be somewhat extensively cultivated for feeding silk-worms.

**MUSA.** Plantain. 6—1. A splendid genus of plants belonging to the tropics. The stems are straight, erect, from five to twenty-five feet high, thick, round, smooth, fungous, watery; the leaves are from three to ten feet long and under two feet wide. The flowers, which are in large terminating racemes, are succeeded by oblong, fleshy berries, sweet and nourishing. *M. paradisiaca*, *Common Plantain*, is fifteen or twenty feet high, with a soft, herbaceous stem, and leaves often more than six feet long and nearly two feet broad. The spike of flowers, which rises from the centre of the leaves, is near four feet long. The fruit which succeeds is eight or nine inches long and above an inch in diameter, a little incurved, with three angles; the pulp of a sweet and luscious flavor. The spikes of fruit are often so large as to weigh forty pounds. Gerard says that "the Grecians and Christians which inhabit Syria, and the Jewes also, suppose it to be that tree of whose fruit *Adam* did taste; which others

thinke it to be a rediculous fable." Others have supposed it to be the grapes brought out of the promised land by the spies of Moses. It is not considered a native of America, but is cultivated in every climate where it will thrive.

**MYOSOTIS.** Scorpion-grass. 5—1. Calyx inferior, of one leaf, deeply five-cleft; segments acute, equal; corolla of one petal, salver-shaped; mouth half-closed with five small valves; filaments very short; anthers small, oblong; germens four; style thread-shaped, central, as long as the tube; stigma obtuse; seeds egg-shaped, pointed, smooth.

*M. scorpioides*, *Marsh Scorpion-grass*, *Water Mouse-ear*: calyx fun-



nel-shaped, with short, broad segments; leaves oblong, roughish, with close bristles; root creeping;

roots very long, creeping; stem from six to twelve inches high; clusters many-flowered, two or three together; limb of the corolla sky-blue, the valves of the mouth yellow. Perennial; flowers in June and July; grows in marshy places and ditches; common.

**MYOSURUS.** Mouse-tail. 5

—6. Calyx inferior, of five lance-shaped, concave, spreading, colored, deciduous leaves, spurred at the base; petals five, very small, tubular, and bearing honey at their base, opening obliquely inwards; filaments five or more, linear, as long as the calyx; anthers oblong, erect, of two linear cells; germens very numerous, egg-shaped, on a long, tapering, erect receptacle; styles none; stigmas minute; seeds oblong, acute, imbricated on the elongated, columnar, acute receptacle.

**M. minimus**, *Mouse-tail*: root small, fibrous; leaves numerous,



rather fleshy, smooth, tapering into

longish stalks; flower-stalks several, erect, each bearing a small pale yellow flower; germens very numerous, forming a long spike, resembling a mouse's tail; annual; flowers in May; grows in corn-fields, meadows, and pastures, in gravelly soil.

**MYRICA.** Candleberry Myrtle.

22—4. Barren flowers: catkin between egg-shaped and oblong, loosely imbricated all round; calyx an egg-shaped scale; corolla none; filaments four, short, hair-like, erect; anthers large, two-lobed.

Fertile flowers: catkin, calyx, and corolla as above; germen egg-shaped, superior; styles two, thread-shaped, spreading, longer than the calyx; stigma acute; berry one-celled; seed one.

**M. GA'LE**, *Sweet Gale*, *Dutch Myrtle*: leaves lance-shaped, broader towards the end, serrate; scales of the catkins pointed; a shrub from one to three feet high, with numerous alternate branches; berries very small. The whole plant exhales a rather pleasant aromatic odor; flowers in May; grows in wet grounds.

**M. CERIFERA**, *Bayberry*, *Wax Myrtle*: leaves oblong, narrowed at base, sub-serrate at end; scales of male catkins acute; berries globose.

A shrub, varying much in its size, being generally found from six to eighteen inches high, but sometimes six or eight feet. It is much branched, and the leaves appear as if somewhat dry or withered. The fruit, which is very abundant, and adheres in dense, irregular clusters to the sides of the branches, consists of a globular stone enveloped with a coating of grayish white wax, or *bayberry-tallow*. This is separated by boiling. It is used by curriers and in the manufacture of candles.

European botanists state that this shrub thrives best in a wet soil, and is confined to the sea-coast. It abounds here, however, in some dry soils, and I have met with it forty miles inland. It is very abundant in some parts of Worcester county, Mass.

**MYRIOPHYLLUM.** Water-Millfoil. 21—7. Barren flowers: calyx of four oblong, erect leaves, the outer largest; petals four, inversely egg-shaped; filaments eight, hair-like, longer than the calyx; anthers oblong.

Fertile flowers beneath the others: calyx and corolla the same; germens four, inferior, oblong; styles

none; stigmas downy; drupes four, oblong; nuts solitary, with a hard shell, containing a single kernel.

**M. SPICA'TUM**, *Spiked Water-Millfoil*: flowers in whorled, interrupt-



ed, leafless spikes; stem slender, branched, round, several feet long, with finely pinnatifid, spreading leaves, four together in a whorl; petals reddish. Perennial; flowers in July and August; grows under water, in ditches, ponds, and sluggish streams.

**M. VERTICILLATUM**, *Whorled Water-Millfoil*: flowers axillar; stems several feet high, the flowering part of the stem or branches rising above the water; petals small, white; perennial; flowers in July; grows in ditches and ponds.

## N.

## NARCIS'SUS. 6—1.

N. POET'ICUS, *Poetic Narcissus*: flowers solitary; cup of the nectary very short, membranous and notched at the edge; leaves bluntly keeled, with reflected edges; flower pure white; the nectary edged with crimson; fragrant.

N. PSEUDO-NARCISSUS, *Common Daffodil, Yellow Daffy, Daffy-down-dilly*: flowers solitary; cup of the nectary bell-shaped, erect, curled, as long as the egg-shaped petals; petals pale yellow; nectary deep yellow.

This genus constitutes a numerous and interesting family of plants, none of which are native, but many have long been cultivated in our gardens. "Galen saith, that the roots of Narcissus haue such wonderfull qualities in drying, that they consound and glew together very great woundes, yea and such gashes or cuts as happen about the veins, sinues, and tendons." "The distilled water of Daffodils doth cure the palsie, if the patient be bathed and rubbed with the sayd liquor by the fire. It hath been proued by an especiall and trusty friend

of mine, a man learned, and a diligent searcher of nature, Mr. Nicolas Belson, sometime of Kings Colledge in Cambridge."—Gerard.

NEOTTIA. 20—1. Calyx superior, of three egg-shaped, converging, permanent, colored leaves; petals two, oblong, erect, converging under the upper leaf of the calyx; nectary spurless, as long as the calyx, prominent, oblong, bluntish, keeled beneath; anther roundish, parallel to the stigma, of two cells, close together; germen inversely egg-shaped, with three furrows; style short, thick, cylindrical; stigma prominent, globose, with two points; capsule inversely egg-shaped, with three furrows; seeds very minute.

N. CERNU'A, *Ladies' Traces*: leaves lanceolate, three-nerved; stem round, somewhat fleshy, invested by short, alternate, leafy sheaths; spike dense, oblong; flowers curving outwards, dull white; August, September; perennial. A pretty plant, found in moist grounds. It is characterized by its twisted spike; its flowers, which are of a very delicate fragrance, being arranged on it in a spiral line.

NEPETA. Cat-Mint. 14—1. Calyx of one leaf, tubular, cylindric

cal, with five acute, erect teeth; corolla gaping; tube cylindrical, slender, incurved, dilated at the throat, which has on each side a narrow, reflected lobe; upper lip erect, roundish, slightly cleft; lower rounded, concave, large, undivided, with numerous notches; filaments awl-shaped, close to each other, covered by the upper lip; anthers incumbent; germen small, four-cleft; style thread-shaped, of the length of the stamens; stigma cleft, acute; seeds four, nearly egg-shaped, even, in the bottom of the dry permanent calyx.

**N. CATARIA**, *Common Cat Mint*, *Catnep*: flowers in spikes; whorls on short stalks; leaves stalked, heart-shaped, with tooth-like serratures; the whole plant soft and downy; stems two or three feet high, erect, branched; leaves paler beneath; flowers numerous, white, lower lip dotted with crimson.

A well-known plant, very common about old buildings. It has a pleasant aromatic odor, which cats are remarkably fond of. *Catnep tea* is one of the *airb-drinks* of the country, and a popular remedy for colds, head-aches, &c.

**NICOTIANA**. Tobacco. 5—1.

**N. TABACUM**, *Virginian Tobacco*:

leaves sessile, oblong, lanceolate, acuminate, the lower ones decur-



rent; mouth of corolla inflated; segments acuminate. This was probably introduced from South America or the West Indies. It is now extensively cultivated in the southern states. Its uses are well known.

**NUPHAR**. 13—1. Calyx inferior, of five or six large, oblong, tough, permanent leaves; petals numerous, oblong, much smaller than the calyx, placed upon the receptacle, furrowed and nectariferous at the back; filaments very numerous, linear, recurved; anthers linear, two-celled; germen nearly sessile, egg-shaped; style none; stigma circular, convex, entire or notched, with many central, radiating clefts; berry hard, egg-shaped, pointed,

many-celled ; seeds numerous, egg-shaped.

*N. AD'VENA*, *Yellow Water Lily* : calyx six-leaved ; edge of the stig-



ma crenate or undulated ; lobes of the leaves meeting ; flowers yellow ; May, June. Perennial ; very common in ditches and other still waters, the leaves, or pods, sometimes entirely covering the surface. The flower is curious and well worth an examination. This plant is accurately and minutely described in Bigelow's "Plants of Boston and its Vicinity."

*NYMPHÆA*. *Water Lily*. 13  
—1. Calyx inferior, of four large, oblong, tough, permanent leaves, colored on their upper surface ; petals numerous, oblong, placed in several rows upon the base of the germen ; nectary globular, in the centre of the stigma ; filaments very numerous, flat, placed on the germen, the lower gradually more dilated ; anthers linear, two-celled ; germen sessile, globular ; style none ; stigma circular, of numerous

rays, which are pointed and separate at the end ; berry hard, globular, many-celled ; seeds numerous, roundish.

*N. AL'BA*, *White Water Lily* : leaves heart-shaped, entire ; petals



oblong ; rays of the stigma sixteen, recurved ; root tuberous, horizontal ; leaves floating, nearly circular, heart-shaped, smooth ; stalks of the leaves and flowers cylindrical ; flowers about four inches in diameter, floating when expanded ; calyx-leaves white above ; petals white ; July, to September.

Whether we consider their beauty or exquisite fragrance, there are few flowers preferred to those of the common *white lily*. The situations in which they grow, where such ornaments might be least expected, gives them additional interest. In shallow ponds, the surface of the water is sometimes covered with them ; in deeper water they are confined to the margin. A distinct variety, the flower rather smaller

with the petals finely shaded with crimson, is found in Washacum pond, in Sterling, Mass., from which it has been introduced into the botanic garden in Cambridge. The leaves are somewhat smaller, and the lobes separated more than in the white kind.

NYS'SA. Tupelo. 23—2.

N. SYLVA'TICA, *Black Gum*. This tree is multiplied in all the southern states. It is designated by the names of *Black Gum*, *Yellow Gum* and *Sour Gum*, none of which is founded upon any of its characteristic properties; but as they have become sanctioned by use, however ill-chosen, we have adopted the first, which is the most common. The vegetation of this tree exhibits a remarkable singularity: in Maryland, Virginia and the western states, where it grows on high level grounds, with the oaks and walnuts, it is distinguished by no peculiarity of form; in the lower part of the Carolinas and of Georgia, where it is found only in wet places with the small magnolia, the red bay, the loblolly bay and the water oak, it has a pyramidal base resembling a sugar-loaf. A trunk eighteen or twenty feet high, and seven or eight inches in diameter at the surface, is

only two or three inches thick a foot from the ground; these proportions, however, vary in different individuals.

The black gum is much superior in size to the tupelo, being frequently sixty or seventy feet in height and eighteen or twenty inches in diameter. The bark of the trunk is whitish and similar to that of the white oak. The leaves are five or six inches long, alternate, entire, of an elongated, oval form, and borne by short and downy petioles. The flowers open in April or May, are small, not conspicuous, and collected in bunches. The fruit is of a deep blue color, and of a lengthened oval shape, and contains a slightly convex stone, longitudinally striated on both sides.

The wood of this tree is fine-grained but tender, and its fibres are interwoven and collected in bundles, an arrangement characteristic of the genus. The alburnum of stocks growing upon dry and elevated lands is yellow. In Virginia this wood is employed for the naves of carriage wheels; at Baltimore, Philadelphia, etc., it is preferred for hat-makers' blocks, being less liable to split; at the south it is used in the rice mills for the cylinder which receives

the cogs ; it is also chosen by shipwrights for the cap, or the piece which receives the topmast.

N. AQUATICA, *Tupelo Gum Tree*. This tupelo, which prefers wet



grounds, is found in the northern and middle states. It seldom rises above forty or forty-five feet in height, with a diameter of fifteen or twenty inches ; its limbs, which spring five or six feet from the ground, affect a horizontal direction ; the shoots of the two preceding years are commonly simple, and widely divergent from the branches. The trunk is of a uniform size from its base : while it is less than ten inches in diameter the bark is not remarkable, but on full-grown and vigorous stocks it is thick, deeply furrowed, and, unlike the bark of any other tree, divided into hexa-

gons, which are sometimes very regular. The leaves are three inches long, oboval, smooth, slightly glaucous beneath, alternate, and often united in bunches at the extremity of the young lateral shoots. The flowers are small, scarcely apparent, collected in bunches and supported by petioles one or two inches in length. They open in April or May. The fruit, which is always abundant, is of a deep blue color, about the size of a pea, and attached in pairs. It is ripe in October, and persisting after the fall of the leaves, it serves for a part of the food of the red-breasts in their autumnal migration to the south. The stone is compressed on one side, a little convex on the other, and longitudinally situated.

The tupelo holds a middle place between trees with soft and those with hard wood. When perfectly seasoned the sap is of a slight reddish tint, and the heart of a deep brown. Of trees exceeding fifteen inches in diameter, more than half the trunk is hollow. The ligneous fibres which compose the body of trees in general are closely united, and usually ascend in a perpendicular direction. But the genus which we are now considering exhibits, on



the contrary, a constant peculiarity of organization ; the fibres are united in bundles, and are interwoven like a braided cord ; hence the wood is extremely difficult to split, unless cut into short billets. This property gives it a decided superiority for certain uses ; in New York, New Jersey, and particularly at Philadelphia, it is exclusively employed for the naves of wheels destined for heavy burthens. Wooden bowls are made of it, which are heavier than those of poplar, but less liable to split. As a combustible it is esteemed for consuming slowly and diffusing a great heat.

In New England this tree is called *Hornbeam*, a name which properly belongs to a species of *Carpinus*.

# O.

**CENOTHEA.** 8—1. Calyx superior, of one leaf, deciduous ; tube cylindrical, limb deeply divided into four oblong segments ; petals four, inversely heart-shaped, attached to the summit of the tube of the calyx, and as long as the limb ; filaments awl-shaped, incurved, shorter than the petals ; anthers oblong ; germen inferior, oblong, furrowed ; stigma divided into four obtuse,

spreading segments ; capsule oblong, bluntly quadrangular, four-celled, four-valved ; seeds numerous, angular, beardless.

**Æ. BIENNIS**, *Common Evening Primrose* : leaves between egg-shaped and lance-shaped, flat ; stem rough, somewhat hairy ; petals undivided ; stem three to five feet high, leafy, angular ; leaves alternate, acute, toothed, downy ; flowers numerous, bright yellow, in terminal spikes ; biennial ; flowers in July, August, September.

**ONOPORDUM.** *Cotton Thistle.* 19—1. Common calyx roundish, tumid, imbricated, of numerous, lance-shaped, thorn-pointed scales, permanent ; compound corolla uniform, with very numerous, equal, funnel-shaped corollas, their tube very slender ; the limb deeply divided into five linear, equal segments ; filaments hair-like, very short ; anthers united into a five-toothed cylindrical tube ; germen inversely egg-shaped, short ; style thread-shaped, longer than the stamens ; stigma oblong, notched ; seed inversely egg-shaped, pointed, smooth ; seed-down hair-like, sessile, rough, deciduous ; receptacle fleshy, convex, deeply cellular, somewhat chaffy.

**O. ACANTHIUM**, *Common Cotton*

**Thistle**: scales of the calyx awl-shaped, spreading in every direction;



leaves oblong, inclining to egg-shaped, sinuated, woolly on both sides; stem four or five feet high, branched, woolly; flowers large, purple; biennial; flowers in July and August; grows in waste ground.

O'LEA. Olive. 2—1.

**O. AMERICANA, Devil-Wood**: leaves elliptic-lanceolate; bracteas



all persistent, connate, ovate; racemes sub-compound, narrow. This

tree is confined to the sea-shore of the southern states. It is sometimes thirty or thirty-five feet high, and ten or twelve inches in diameter; but this size is extraordinary. It commonly fructifies at the height of eight, ten or twelve feet. The bark which covers the trunk is smooth and grayish. The leaves are four or five inches long, opposite and lanceolate, entire at the edge, smooth and brilliant on the upper surface, and of an agreeable light green. They are evergreen, or at least are partially renewed once in four or five years. The fertile and barren flowers are on separate trees; they are very small strongly scented, of a pale yellow, and axillary, or situated between the petiole and the leaves and branches. The season of flowering in the neighborhood of Charleston, South Carolina, is about the end of April. The fruit is round, and about twice as large as a common pea. When ripe, it is of a purple color, approaching to blue, and consists of a hard stone thinly coated with pulp. As it remains attached to the branches during a part of the winter, its color forms, at this season, an agreeable contrast with the foliage.

The wood of this tree has a fine and compact grain, and when perfectly dry it is excessively hard and very difficult to cut and split; hence is derived the name of *Devil-Wood*. It is, notwithstanding, neglected in use. On laying bare the cellular integument of the bark, its natural yellow hue changes instantaneously to a deep red; and the wood by contact with the air assumes a rosy complexion.

**ORCHIS.** 20-1. Calyx superior, of three egg-shaped, partly colored leaves; petals two, oblong, smaller than the calyx, ascending; nectary a roundish or oblong lip, generally lobed, larger than the petals, hanging down anteriorly between the lower leaves of the calyx, and extended behind in the form of a tubular spur; anther of two oblong cells, each containing an inversely egg-shaped elastic mass of pollen, and opening lengthwise in front; germs oblong or nearly cylindrical, furrowed, spirally twisted; style thick and short; stigma a shining moist depression, in front, under or between the masses of pollen; capsule oblong, spiral; seeds numerous, oval.

**O. CILIARIS**, *Fringed Yellow Orchis*: lip oblong-lanceolate, pinnately ciliate, twice as long as the

petals; spur longer than the germ; root perennial, composed of two small tubes; stem one or two feet high, leafy, glabrous; leaves lanceolate, acute, entire, nerved, sheathing at base, six to eight inches long, one or two wide; flowers in a terminal spike, of a bright orange yellow, each protected by a leaf at base; perianth six-parted, three segments exterior, the upper erect, concave, the two lower obovate, deflected; three interior, the two lateral very small, incised at the summit; the inferior segment or labelum narrow, lanceolate, longer than the lateral segments, beautifully laciniate or fringed; July, August; found in wet soils on the margins of swamps.

**O. BLEPHARIGLOTTIS**, *Fringed White Orchis*. A species found intermingled with *O. ciliaris*, from which it is hardly to be distinguished except by the color of its flowers, which are pure white.

**O. PSYCOIDES**, *Ragged Orchis*: lip twice as long as the petals, three-parted, with the segments many-cleft; exterior petals ovate-lanceolate, the interior linear; spur shorter than the germ; stem slender, glabrous, twelve to eighteen inches high; leaves narrow lanceolate, nerved, sheathing at base;

flowers scattering along a terminal spike; bracteal leaf shorter than the germs; flowers pale yellow; July; grows in pastures and meadows.

This genus comprises several species, all curious and interesting plants. *O. GRANDIFLO'RA* grows to the height of more than two feet, producing beautiful large purple flowers, the petals fringed on the sides.

*ORIG'ANUM*. Marjoram. 14—1 Involucre of numerous imbricated, egg-shaped, flat, colored leaves, one under each flower, longer than the calyx; calyx of one leaf, with an obtusely angular tube; corolla gaping; tube cylindrical, compressed, upper lip erect, flat, obtuse, notched; lower lip deeply divided into three nearly equal, undivided lobes; filaments thread-shaped, as long as the corolla; anthers distant, egg-shaped, two-lobed; germen four-lobed; style thread-shaped, ascending; stigma slightly notched; seeds four, egg-shaped, in the bottom of the closed calyx.

*O. VULGA'RE*, *Common Marjoram*: spikes roundish, panicked, crowded, erect; involucre leaves egg-shaped, longer than the calyx; stem a foot high, purplish, leafy, with short recurved hairs; leaves egg-shaped, very slightly serrate, opposite, dot-

ted, hairy, sprinkled with resinous dots; flowers light purple. It has a



warm aromatic flavor. Perennial; flowers in July and August; grows in bushy places and dry banks.

The pot-herb of our gardens, called *Sweet Marjoram*, is *O. MARJORA'NA*, an exotic. This is an agreeable aromatic, and is used by the cook in a variety of dishes.

*OS'TRYA*. Hop-Hornbeam. 21—7.

*O. VIRGIN'ICA*, *Hop-Hornbeam*, *Iron-Wood*: leaves ovate, acuminate, ser-



rate; cones oblong-ovate, pendulous,

somewhat resembling those of the hop. This tree, which never occurs in masses, is generally disseminated throughout the United States, but most abundantly in the middle states. In New England it is sometimes called *Lever-Wood*, from one of the uses to which it is applied. It seldom arrives to more than thirty-five or forty feet in height and twelve or fifteen inches in diameter, and commonly not exceeding half these dimensions. In the winter this tree is recognised by a smooth, grayish bark, finely divided, and detached in strips not more than a line in breadth. The leaves are alternate, oval-acuminate, and finely and unequally denticulated. The fertile and barren flowers are borne at the extremity of different branches of the same tree, and the fruit is in clusters like hops. The small, hard, triangular seed is contained in a species of reddish, oval, inflated bladder, covered at the age of maturity with a fine down, which causes a violent irritation of the skin if carelessly handled. The wood is perfectly white, compact, fine-grained and heavy. The concentric circles are closely compressed, and their number in a trunk of only four or five inches in diameter evinces

the length of time necessary to acquire this inconsiderable size. To its inferior dimensions must be ascribed the limited use of the tree, the superior properties of whose wood are attested by its name. In New England the iron-wood is used for levers, brooms and scrubbing-brushes. Though its uses are unimportant, they might be more diversified; it is well adapted for mill-cogs, mallets, &c.

OXALIS. Wood-Sorrel. 10—4. Calyx inferior, deeply divided into five acute, permanent segments; petals five, much longer than the calyx, obtuse, connected laterally by their claws; filaments hair-like, erect, the five outer shorter; anthers roundish; germen superior, oblong, five-cornered; styles five, thread-shaped; stigmas obtuse, downy; capsule membranous, five-cornered, five-celled; seeds roundish, polished.

O. ACETOSEL'LA, *Common Wood-Sorrel*: leaves all radical, ternate, inversely heart-shaped, hairy; scape single-flowered; root scaly; leaflets bright green, often purplish beneath; bractees two, opposite; petals white, streaked with purplish veins, yellow at the base; flowers in May, June; perennial; grows in woods and shady places.

*O. VIOLA'CEA*, *Violet Wood-Sorrel*: leaflets three, obcordate, smooth;



umbels three to nine-flowered; styles short; flowers nodding; flowers pale purple or red; May; perennial.

*OXYCOC'CUS*. Cranberry. 8—

1. Calyx superior, very small, permanent, four-toothed; corolla of one petal, bell-shaped, with four revolute segments; filaments awl-shaped, flattened, fixed to the receptacle; anthers oblong, with two points, erect, terminal; germen inferior, roundish; style simple, cylindrical, erect, longer than the stamens; stigma obtuse; berry globular, with a central depression, four-celled; seeds few, small.

*O. MACROCAR'FUS*, *Craneberry*, *Cranberry*: flowers terminal; leaves egg-shaped, entire, revolute, acute; stems creeping, thread-shaped, smooth; corolla deeply four-cleft; stems slender, prostrate; flowers several together, pale white; berry

deep red, acid. The berries made into tarts are much esteemed. A shrub; flowers in June; grows in swamps and meadows, generally preferring peat soils.

## P.

*PÆONIA*. Pæony. 13—2.

*P. OFFICINA'LIS*, the common pæony, is an exotic, but is very common, and almost every garden has its *Piney*, (as it is improperly called,) which is among the first to bring forth its flowers, which for size and beauty are, in its season, unrivalled. There are many species of pæony; some from China are very splendid. The *Double White* is one of the most beautiful, and very large. It is not very common.

*PA'NAX*. 23—2.

*P. QUINQUEFOLIUM*, *Ginseng*: leaves



ternate or quinate; leaflets ovate,

acuminate, serrate; stem herbaceous, smooth, round, one or two feet high, branching at the top; three leaves with long, smooth foot-stalks; the leaves are divided into three or five sharply serrated leaflets; flowers small, light yellow, in a simple umbel; peduncle shorter than the leaf-stalks, slender, smooth, erect, rising from the top of the stem; flowers in June, July; perennial. In China, the roots of this plant have always been considered an invaluable drug, and it forms an ingredient in every medicine used by the Chinese and Tartars.

PAPAVER. Poppy. 13—1.

Many species of poppy are common in our gardens. They are beautiful plants, and easily cultivated. One species, *P. somniferum*, produces the singular medicine opium, for which it is extensively cultivated in Turkey, Persia and India. This drug may be produced from other species, and all have strong narcotic properties. "It mitigateth all kind of paines: but leaveth behinde it oftentimes a mischief worse than the disease it selfe, and that hard to be cured, as a dead palsie and such like."—*Gerard*.

PARNASSIA. Grass of Parnassus. 5—4. Calyx inferior, of

one leaf, deeply divided into five oblong, spreading, permanent segments; petals five, egg-shaped, spreading, longer than the calyx, with several longitudinal ribs; nectaries five fleshy scales, attached to the claws of the petals, fringed with a row of bristles, each bearing a small transparent globe; filaments awl-shaped, spreading; anthers heart-shaped, flattened; germen egg-shaped, large; styles none; stigmas four, obtuse, permanent; capsule egg-shaped, four-cornered, four-celled, four-valved; receptacles four, linear, abruptly terminating the partitions, which are from the middle of each valve; seeds numerous, oblong.

*P. CAROLINIANA*, Grass of Parnassus: radical leaves nearly orbic-



ular, smooth, entire; nectaries with three bristles; corolla five-petalled;

stem about a foot high, with a leaf which clasps it nearly round the middle; flowers white; August; perennial; a beautiful plant, growing in meadows.

**PASTINACA.** Parsnep. 5—2. Flowers regular, uniform, perfect; calyx superior, of five very minute teeth; petals five, broadly lance shaped, pointed, involute; stamens thread-shaped, spreading, as long as the petals; anthers roundish; germen egg-shaped, obscurely striated; styles at first very short, erect, afterwards elongated, spreading, recurved, greatly dilated at the base; stigmas knobbed; fruit broadly elliptical, transversely compressed, crowned by the broad, round, waved, floral receptacle and the styles; seeds broadly elliptical, with a slight notch at the top, flattish at the back, with three ribs, and two more prominent and broader ones at the circumference, their border narrow, thin, acute; juncture close, flat, nearly as broad as the seeds.

**P. SATIVA,** *Common Wild Parsnep*: leaves simply pinnate, downy beneath; root spindle-shaped; stem three or four feet high, erect; flowers yellow, small; biennial; flowers in July. This is the common parsnep in its wild state. The root is

small, rigid, and acrid, very different from the fine, sweet vegetable rendered esculent by culture. It is an exotic, but naturalized, and very abundant in waste grounds. The parsnep, though disagreeable to some, is very generally esteemed as a culinary vegetable. Gerard, it seems, did not fancy it much, and expressed himself after this sort: "There is a good and pleasant foode or bread made of the rootes of parsneps, as my friend master Plat hath set forth in his booke of experiments, which I haue made no triall of, nor meane to do."

**PEDICULARIS.** Lousewort. 14—2. Calyx of one leaf, with a roundish, tumid, somewhat compressed tube, with five, sometimes only two, unequal, leafy, jagged segments; corolla gaping; tube oblong, unequal; upper lip narrower, erect, vaulted, compressed, notched; lower lip dilated, flat, deeply divided into three obtuse segments, the middle one narrower; nectary a gland under the germen; filaments thread-shaped, concealed by the upper lip; anthers two-lobed, acute at the lower part, compressed; germen egg-shaped; style thread-shaped, longer than the stamens; stigma simple, bent downwards; capsule



oblong, pointed, oblique, two-celled, two-valved, the partitions from the centre of each valve; seeds few, angular, pointed, attached to a nearly globular receptacle at the base.

*P. CANADENSIS*, *Canadian Lousewort*: stem erect, simple; spike



somewhat leafy, terminal; helmet setaceous, two-toothed; calyx truncated downwards; height about a foot; flowers yellowish; May; perennial; grows in pastures. Plants of this genus were supposed to occasion lice in the sheep which feed on it; whence the name.

*PHASEOLUS*. Kidney Bean. 17—4.

*P. TRILOBUS*, *Three-lobed Bean-vine*: stem smooth, twining, pubescent; lateral leaflets two-lobed, terminal ones three-lobed, segments ovate; peduncles three-flowered, longer than the petioles; flowers in July; annual.

This genus contains many species, most of which are natives of tropical climates. Several are well

known in our gardens, as the *common kidney bean*, *P. VULGARIS*; *Lima bean*, *P. LUNATUS*; *bush bean*, *P. NA'NUS*, &c.

*PINGUICULA*. Butterwort. 2—1. Calyx small, gaping, permanent; upper lip erect, three-cleft; lower reflected, cleft; corolla gaping, having the margin irregularly five-cleft, with a spur behind; segments two-lobed or emarginate; filaments cylindrical; anthers roundish; germen globose; style very short; stigma with two unequal lips; capsule egg-shaped, one-celled; seeds numerous, cylindrical.

*P. ELA'TIOR*, *Tall Pinguicula*: nectary subulate, obtuse, shorter than the corolla; tube ventricose above; scape villous beneath; flowers white; May; height about a foot; perennial.

Several other species are found on the pine-barrens of the south, near the sea-shore.

*PINUS*. Pine. 21—8. Barren flowers: catkins deciduous, of numerous, naked, spreading stamens, connected by a common stalk; calyx none; corolla none; filaments very short; anthers erect, wedge-shaped, two-celled, crowned with a jagged membranous crest. Fertile flowers: catkin egg-shaped or round-

ish, of numerous, imbricated, close, stiff, permanent, two-flowered scales; corolla none; germens two; style one to each germen; stigmas simple; cone egg-shaped, hard, of numerous, woody, permanent scales; seeds two to each scale, oval, each crowned with a membranous wing.

*P. RUBRA, Red Pine, Norway Pine*: leaves united in pairs, five



or six inches long, collected in bundles at the ends of the branches; cones rounded at the base, abruptly pointed. This pine abounds in the northern part of the United States, being met with from New York to the north part of Canada. Under favorable circumstances it attains the height of seventy or eighty feet, with a diameter of two. It is chiefly remarkable for the uniform size

of its trunk for two-thirds of its length. The bark upon the body of the tree is of a clearer red than upon that of any other species in the United States; hence is derived its popular name, *Red Pine*.

The concentric circles are crowded in the red pine, and the wood, when wrought, exhibits a fine, compact grain. It is rendered heavy by the resinous matter with which it is impregnated, and in Canada, Nova Scotia, and the state of Maine, it is highly esteemed for strength and durability, and is frequently employed in naval architecture, especially for the decks of vessels, for which it furnishes planks forty feet long without knots. Stripped of the sap, it makes very lasting pumps.

*P. MYRTIS, Yellow Pine*: leaves united in pairs, four or five inches long, hollowed on the inner surface; cones oval, armed with spines, an inch and a half long. This tree is widely diffused in North America, and is known in different places by different names: in the middle states, where it is abundant and in common use, it is called *Yellow Pine*, in the Carolinas and Georgia, *Spruce Pine*, and more frequently *Short-leaved Pine*. Towards the

north, this species is not found beyond certain districts of Connecticut, Massachusetts and New Hampshire. It attains the height of fifty or sixty feet with a diameter of fifteen or eighteen inches. The concentric circles of the wood are six times as numerous in a given space as those of the pitch and loblolly pines. In trunks fifteen or eighteen inches in diameter, there are only two inches, or two and a half, of sap, and still less in such as exceed this size. The heart is fine-grained and moderately resinous, which renders it compact without great weight. Long experience has proved its excellence and durability. It is employed for floors of houses, for the casings of doors and wainscots, and for window sashes. Immense quantities are used in the dock-yards of New York, Philadelphia, Baltimore, &c., for the decks, masts, yards, beams and cabins of vessels, and it is considered as next in durability to the long-leaved pine. The wood from New Jersey and Maryland is fine-grained, more compact, and stronger than that from the river Delaware, which grows upon richer lands.

P. INOPS', *New Jersey Pine* : leaves in pairs, flat on the inner surface,

one or two inches long, stiff, scattered over the young branches; cones about two inches long, rounded at the base. This tree abounds in the middle states. It is sometimes thirty or forty feet high and twelve or fifteen inches in diameter, but it rarely attains these dimensions. The trunk, which is clad in a blackish bark, tapers sensibly from the base to the summit, and



half its length is occupied by limbs remote from each other. The size of this tree forbids the useful employment of its wood, not to mention the disadvantage under which it exists of containing a large proportion of sap. In Kentucky a small quantity of tar is obtained from the heart, and is consumed in the vicinity.

**P. FUNGENS**, *Table Mountain Pine*: leaves in pairs, thick, stiff, two inches and a half in length; cones sessile, about two inches in length, armed with strong spines. This pine is found only within a small region of the Alleghanies, in North Carolina. Its height is forty or fifty feet, with a proportionate diameter.

**P. AUSTRALIS**, *Long-leaved Pine*: leaves united in threes, about a foot



long, collected in bunches at the ends of the branches; cones seven or eight inches long, armed with small retorted spines. This tree abounds in the middle and southern states. Its height is sixty or eighty feet, with a uniform diameter of fifteen or twenty inches, forty or fifty feet. Some stocks, favored by local circumstances, attain much

larger dimensions, particularly in East Florida. The bark is somewhat furrowed, and the epidermis detaches itself in thin, transparent sheets. The buds are very large, white, fringed, and not resinous. The bloom takes place in April; the male flowers form masses of divergent violet-colored aments about two inches long; in drying they shed great quantities of yellowish pollen, which is diffused by the wind, and forms a momentary covering on the surface of the land and water. In the fruitful year they are ripe about the middle of October, and shed their seeds the same month. The kernel is of an agreeable taste, and is contained in a thin, white shell, surmounted by a membrane; in every other species of American pine the shell is black.

The wood of this tree contains but little sap; trees fifteen inches in diameter three feet from the ground frequently have ten inches of heart. Many stocks of this size are felled for commerce, and none are received for exportation of which the heart is not ten inches in diameter when squared. The concentric circles in a trunk fully developed are close and at equal distances, and the res-

inous matter, which is abundant, is more uniformly distributed than in the other species; hence the wood is stronger, more compact and more durable: it is, besides, fine-grained, and susceptible of a bright polish. These advantages give it a preference to every other pine; but its quality is modified by the nature of the soil in which it grows. In the vicinity of the sea, where only a thin layer of mould reposes upon the sand, it is more resinous than where the mould is five or six inches thick; the stocks that grow upon the first-mentioned soil are called *Pitch Pine*, and the others *Yellow Pine*, as if they were distinct species. This wood subserves a great variety of uses in the Carolinas, Georgia and the Floridas; four-fifths of the houses are built of it, except the roof, which is covered with the shingles of the cypress; but in the country the roof is also of pine, and is renewed after fifteen or eighteen years. A vast consumption takes place for the inclosure of cultivated fields. In naval architecture this is the most esteemed of the pines; in the southern states, the keel, the beams, the side-planks and the pins by which they are attached to the ribs, are of this tree.

For the deck it is preferred to the true yellow pine. In certain soils this wood contracts a reddish hue, and it is for that reason known in the dock-yards of the northern states by the name of *Red Pine*. Wood of this tint is considered best, and in the opinion of some shipwrights it is more durable on the sides of vessels, and less liable to injury from worms, than the oak. The value of this tree does not reside exclusively in the wood; it supplies nearly all the resinous matter used in the United States in ship-building, and a large residue for exportation to the West Indies and Europe.

P. SEROTINA, *Pond Pine*. The pond pine frequently recurs in the maritime parts of the southern states, but it is lost as it were among the long-leaved pines which cover these regions. It receives its specific name on account of its growing principally on the borders of ponds, and in swamps where the soil is black and miry. It sometimes grows in abandoned fields on the borders of swamps in dry, sandy soils.

The ordinary size of this tree is thirty-five or forty feet, with a diameter of fifteen or eighteen inches. The leaves, united to the number

of three, are five or six inches in length, and a little more upon young stocks. The aments are straight, and six or eight lines long; the cones are commonly opposite and in pairs, two inches and a half in length, five inches and a half in circumference, and in form like an egg; their scales are rounded at the extremity, and armed with fine, short spines, which are easily broken off, so that in some instances no vestige is left of their existence. The cones arrive at maturity the second year, but do not release their seeds before the third or fourth. This tree is remarkable for the remoteness of its branches, which begin to spring upon the lower half of the stock; and more than half of the largest trunk consists of sap; for these reasons the species is useless in the arts.

*P. RIGIDA*, *Pitch Pine*: leaves in threes, varying in length; cones pyramidal, two or three inches long. This species is known in all the United States by the name of *Pitch Pine*, and sometimes in Virginia by that of *Black Pine*. Except the maritime parts of the Atlantic states, and the fertile regions west of the Alleghany mountains, it is found throughout the United States, but

most abundantly upon the Atlantic coast, where the soil is diversified but generally meagre. In Maine, New Hampshire and Vermont it grows almost exclusively in light, even, pliable, sandy soils. In the lower



part of New Jersey, Pennsylvania and Maryland, it is frequently seen in the large swamps filled with the red cedar, which are constantly miry or covered with water. In such situations it is seventy or eighty feet high and from twenty to twenty-eight inches in diameter, and exceeds the surrounding trees both in bulk and elevation. In Pennsylvania and Virginia, on the Alleghanies, it grows to the height of thirty-five or forty feet with a diameter of twelve or fifteen inches. And in Maine and Vermont it seldom grows

more than twenty or twenty-five feet in height, and its slender branches, laden with puny cones, evince the feebleness of its vegetation. The buds of this tree are always resinous, and its triple leaves vary in length from an inch and a half to seven inches, according to the degree of moisture of the soil. The aments are an inch long, straight and winged like those of the pond pine. The size of the cones depends upon the nature of the soil, and varies from less than an inch to more than three inches in length; they are of a pyramidal shape, and each scale is pointed with an acute spine about two inches long. Wherever these trees grow in masses the cones are dispersed singly over the branches, and they release the seeds the first autumn after their maturity; but on solitary stocks, exposed to the buffeting of the winds, the cones are collected in groups of four, five or even a larger number, and remain closed for several years.

The pitch pine has a thick, blackish, deeply furrowed bark. It is remarkable for the number of its branches, which occupy two thirds of its trunk and render the wood extremely knotty. The concentric

circles are widely distant, and three fourths of the larger stocks consist of sap. On mountains and gravelly lands the wood is compact, heavy and surcharged with resin, whence is derived the name *Pitch Pine*: in swamps, on the contrary, it is light, soft, and composed almost wholly of sap; it is then called *Sap Pine*. These essential defects place it below the yellow pine, but as that species is constantly diminishing by the vast consumption in civil and naval architecture, it is partially replaced by the pitch pine, the poorer variety of which is used for the boxes employed in packing certain sorts of merchandise, such as soap, candles, &c. On some parts of the Alleghanies houses are built of it, and the wood, if not covered with paint, is recognised by its numerous knots. It is thought better than the yellow pine for floors that are frequently washed, as the resin with which it is impregnated renders it firmer and more durable. It serves perfectly well for ship pumps, for which purpose trees with very little heart are preferred. It is much esteemed for fuel by bakers and brickmakers. From the most resinous stocks is procured the lampblack of commerce.

**P. TÆDA, Loblolly Pine.** This pine abounds in the middle and southern states. It sometimes exceeds eighty feet in height with a diameter of two or three feet, with a wide-spreading summit. The leaves are fine, of a light green, six inches long, and united to the number of three, and sometimes four on young and vigorous stocks. The bloom takes place in the beginning of April; the aments are nearly an inch long, and are bent and intermingled like those of the long-leaved pine. The cones are about four inches in length, and armed with strong spines; while closed they have the form of an elongated pyramid, and when open of a rhombus more or less perfect: the seeds are cast the first year.

The wood of this tree has a still greater proportion of sap than that of the pond and pitch pines: in trunks three feet in diameter there are thirty inches of alburnum, and those of a foot in diameter and thirty or thirty-five feet in height, not more than an inch of heart. The concentric circles are widely distant, as might be supposed from the rapidity of its growth, in the more southern states; in Virginia, where it vegetates more slowly, its texture

is closer and the proportion of sap less considerable. This wood is much used for building houses in Virginia. In the ports of the southern states it is used, like the pitch pine in those of the north, for the pumps of ships; at Charleston the wharves are built with logs of the loblolly pine consolidated with earth; it is much esteemed by bakers to heat their ovens. It affords turpentine in abundance, but in a less fluid state than that of the long-leaved pine; as it contains more alburnum, from which the turpentine distils, perhaps by making deeper incisions it would yield a greater product.

**P. strobus, White Pine:** leaves generally in fives, four inches long, slender, numerous; cones four or five inches long. This tree abounds throughout the middle and northern states. Near Norridgewock on the river Kennebeck, in one of the swamps, which is accessible only in midsummer, M. Michaux measured two trunks felled for canoes, of which one was one hundred and fifty-four feet long and fifty-four inches in diameter, and the other one hundred and forty-two feet long and forty-four inches in diameter, at three feet from the ground.



Mention is made in Belknap's History of New Hampshire of a white



pine felled near the river Merrimack, seven feet eight inches in diameter. M. Michaux likewise measured a stump near Hallowell, Maine, exceeding six feet in diameter: these enormous trees had probably reached the greatest height attained by the species, which is about one hundred and eighty feet. But this ancient and majestic inhabitant of the North American forests is still the loftiest and most valuable of their productions, and its summit is seen at a great distance, far above the heads of the surrounding trees. The trunk is simple for two-thirds or three-fourths of its height, and the limbs are short and verticillate, or disposed in stages one above an-

other to the top of the tree, which is formed of three or four upright branches seemingly detached and unsupported. In forests composed of other trees, where the soil is strong and proper for the culture of corn, as, for example, on the shores of lake Champlain, it is arrested at a lower height and diffused into a spacious summit; but it is still taller and more vigorous than the neighboring trees. On young stocks not exceeding forty feet in height the bark of the trunk and branches is smooth and even polished; as the tree advances in age it splits and becomes rugged and gray, but does not fall off in scales like that of the other pines. The white pine is also distinguished by the sensible diminution of its trunk from the base to the summit, in consequence of which it is more difficult to procure sticks of great length and uniform diameter: this disadvantage, however, is compensated by its bulk and by the small proportion of alburnum. The leaves are five-fold, four inches long, numerous, slender, and of a bluish green: to the lightness and delicacy of the foliage is owing the elegant appearance of the young trees. The male aments are four or five lines

long, united to the number of five or six, and arranged like those of the loblolly and long-leaved pines; they bloom in the month of May, and turn reddish before they are cast. The cones are four or five inches long, ten lines in diameter in the middle, pedunculated, pendulous, somewhat arched, and composed of thin, smooth scales, rounded at the base. They open about the first of October to release their seeds, of which a part are left adhering to the turpentine that exudes from the scales.

The wood of this species is employed in greater quantities and far more diversified uses than that of any other American pine; yet it is not without essential defects; it has little strength, gives a feeble hold to nails, and sometimes swells by the humidity of the atmosphere. These properties are compensated, however, by others which give it a decided superiority; it is soft, light, free of knots and easily wrought, is more durable, and less liable to split when exposed to the sun, furnishes boards of a great width, and timber of large dimensions, in fine, is still abundant and cheap. It is observed that the influence of soil is greater upon resinous than upon leafy trees.

The qualities of the white pine, in particular, are strikingly affected by it. In loose, deep, humid soils, it unites in the highest degree all the valuable properties by which it is characterized, especially lightness and firmness of texture, so that it may be smoothly cut in every direction; hence the name *Pumpkin Pine*. On dry, elevated lands its wood is firmer and more resinous, with a coarser grain and more distant concentric circles, and it is then called *Scapling Pine*. The wood of this tree is used for every species of ornamental work about building, for *clapboards* and shingles, for looking-glass and picture frames, for images in sculpture, the inside of mahogany furniture and of trunks, in cooperage, and an endless variety of other purposes. It serves exclusively for the masts of the numerous vessels constructed in the northern and middle states. The principal superiority of these masts over those exported to England from Riga is their lightness; but they have less strength, and are said to decay more rapidly between decks and at the point of intersection of the yards: this renders the long-leaved pine superior to the white pine in the opinion of the greater part of Ame-

rican ship-builders. The bowsprits and yards are also made of white pine. The wood is not resinous enough to furnish turpentine for commerce, nor would the labor of extracting it be easy, since this tree occupies exclusively tracts of only a few hundred acres, and is usually mingled in different proportions with the leafy trees.

**PLANTAGO.** Plantain. 4—1. Calyx inferior, of one leaf, four-cleft, permanent; corolla of one petal, tubular, membranous, permanent; tube swelled; limb four-cleft, reflected; filaments thread-like, arising from the tube, exceedingly long; anthers oblong, compressed, two-celled; germen inferior, egg-shaped; style thread-shaped, half as long as the stamens; stigma hairy, acute; capsule egg-shaped, two-celled; seeds oblong, sessile.

**P. MAJOR,** *Greater Plantain*: leaves egg-shaped, smooth, on longish stalks; flower-stalks round; spike long and tapering; seeds numerous; root of long fibres; leaves broad, with seven ribs; stalk from nine to eighteen inches high, somewhat rough with short hairs; flowers white; June, July; perennial.

**P. LANCEOLATA,** *Ribwort Plantain*: leaves lance-shaped; flower-

stalks deeply furrowed; spike egg-shaped; leaves tapering at the base into a broad stalk, hairy at its inser-



tion; stalk about a foot high; spike dark brown; perennial; flowers from May to August; grows in pastures; common.

**P. MARITIMA,** *Sea Plantain*: leaves linear, channelled, nearly entire; flower-stalks round, longer than the leaves; spike cylindrical; roots large, long, somewhat woody; leaves woolly at the base; stalk from three to ten inches high; perennial; flowers in June and July; grows in the clefts of rocks, in dry pastures.

**P. MEDIA,** *Hoary Plantain*: leaves egg-shaped, downy, on very short stalks; flower-stalks round; spike cylindrical; seeds one in each cell; root somewhat woody; leaves

hoary, with seven ribs; stalk about six inches high, downy; perennial; flowers in June and July; grows in pastures and by waysides.

PLAT'ANUS. Plane Tree. 21—7.

P. OCCIDENTA' LIS, *Buttonwood*, *Sycamore*: leaves five-angular, ob-



soletely lobed, toothed, cuneate at the base, downy beneath. Among trees with deciduous leaves, none in the temperate zones, either in the old or new continent, equal the dimensions of the planes. This species is not less remarkable for its amplitude, and for its magnificent appearance, than the plane of Asia, whose majestic form and extraordinary size were so much celebrated by the ancients. In the Atlantic states this tree is commonly known by the name of *Buttonwood*, and sometimes in Virginia by that of *Water Beech*. On the banks of the Ohio, and in the states of Kentucky

and Tennessee, it is most frequently called *Sycamore*, and by some persons *Plane Tree*. The French of Canada and of Upper Louisiana give it the name of *Cotton Tree*.

This tree in no part of the United States is more abundant and more vigorous than along the rivers of Pennsylvania and Virginia; though in the more fertile valleys of the west its vegetation is still more luxuriant, especially on the banks of the Ohio and of the rivers which flow into it. On the margin of the great rivers of the west, the buttonwood is constantly found to be the loftiest and largest tree of the United States. Often, with a trunk of several feet in diameter, it begins to ramify at the height of sixty or seventy feet, near the summit of other trees; and often the base divides itself into several trunks, equally vigorous and superior in diameter to any of the surrounding trees. On a little island in the Ohio, fifteen miles above the mouth of the Muskingum, Michaux mentions a buttonwood which, at five feet from the ground, was forty feet and four inches in circumference, and consequently more than thirteen feet in diameter. He mentions another on the right bank of the Ohio, thirty-six miles

above Marietta, whose base was swollen in an extraordinary manner; at four feet from the ground it was forty-seven feet in circumference. This tree, which still exhibited the appearance of vigorous vegetation, ramified at twenty feet from the ground. A buttonwood of equal size is mentioned as existing in Genessee. The American species is generally thought, in Europe, to possess a richer foliage, and to afford a deeper shade than the Asiatic plane: its leaves are of a beautiful green, alternate, from five to fifteen inches broad, less deeply lobed, and formed with more open angles than those of the plane of the eastern continent. In the spring the lower surface of these leaves is covered with a thick down, which disappears towards summer. The sexes are separate, but the male and female flowers are attached to the peduncle, instead of being placed on different branches. The flowers are in the form of small balls; the fertile ones grow to the diameter of an inch, and are supported by peduncles two or three inches long. These balls fall in the course of the autumn and winter, and, parting asunder, the seeds which compose them are scattered in the wind, by

means of the plummy tuft by which they are surmounted.

The trunk and branches of the buttonwood are covered with a smooth, pale green bark, of which the epidermis detaches itself every year in portions; a sufficiently obvious character is thus afforded, by which to distinguish the tree when deprived of its leaves. The roots, when taken from the earth, are of a beautiful red color; but they lose this tint upon being split and exposed to the light in a dry place. The concentric layers and the medullary rays are also observed to be much more distinct in the roots than in the body of the tree. This wood, in seasoning, becomes of a dull red; its grain is fine and close, and it is susceptible of a brighter polish than the wood of the beech, to which it bears some resemblance. Its concentric circles are divided into numerous sections by fine, medullary rays extending from the centre to the circumference. When a trunk is sawn in a direction parallel to these rays, they appear larger than when it is cut parallel to the concentric circles. It would seem then that the division should be made in the intermediate direction, so that the spots may be of a proper

size and at equal distances, which gives an elegant surface to the wood. Cabinet-makers rarely make use of this wood, on account of its liability to warp, except for bedsteads, which retain the color of the wood and are coated with varnish. This wood speedily decays when exposed to the atmosphere, hence it is only proper for work that is sheltered from the weather; when thoroughly seasoned it may be usefully employed in the interior of houses for joists, and for sheathing the frame. It is never used in naval architecture.

**PODOPHYLLUM.** Duck's-foot.  
13—1.

*P. FELTATUM*, *May-Apple*, *Duck's-foot*, *Wild Mandrake*: leaves pel-



tate, palmate; stem erect, smooth, with two large terminal leaves on long foot-stalks; flower single, on a

short, nodding peduncle, in the fork formed by the petioles of the leaves; flowers in May; height about a foot. A curious plant with white flowers. Grows in cultivated grounds.

**POLYCARPON.** 3—3. Calyx inferior, of five egg-shaped, keeled, permanent leaves; petals five, shorter than the calyx, egg-shaped, notched at the end, permanent; filaments three, sometimes five, thread-shaped, half the length of the calyx; anthers roundish, two-lobed; germen egg-shaped; styles three, short; stigmas blunt; capsule egg-shaped, one-celled, three-valved; seeds numerous, egg-shaped, nearly sessile, on a central receptacle.

*P. TETRAPHYLLUM*, *Four-leaved All-seed*: root tapering; stem much branched, lying flat on the ground; leaves inversely egg-shaped, smooth, stalked, in fours, one pair crossing the other; panicles terminal, repeatedly forked; flowers greenish white; common in Carolina.

**POLYG'ALA.** Milkwort. 17—2. Calyx inferior, of five leaves, the three outer smaller, egg-shaped; petals varying in number, united to the filaments by their claws, limb of the upper deeply divided, the lower keel-shaped, generally crowned with a crested appendage; fila-

aments united at the bottom, divided above into two sets; anthers eight, one-celled, tubular; germen roundish; style club-shaped, straight; stigma two-lipped; capsule round or inversely heart-shaped, compressed, two-valved, two-celled; seeds one in each cell, oval, downy, crested.

*P. SANGUINEA*, *Caducous Polygala*: flowers beardless; peduncle squarrose; stem branched, erect; stem about a foot high; leaves alternate, smooth; spike terminal, cylindrical; flowers purple; August, September; grows in moist grounds.

*P. SENEGA*, *Rattlesnake-Root*, *Seneca Snake-Root*: flowers beardless;



spike terminal, filiform; stem erect, herbaceous, quite simple; leaves alternate, oblong-lanceolate, scattered; perennial; flowers white; July; root woody, branched, contorted, about half an inch thick, and covered with

an ash-colored bark. Its taste is sweetish, and after being chewed it becomes pungent and hot, producing a tingling sensation in the mouth. It was the antidote employed by the Senegan Indians against the bite of the rattlesnake, and it is now a useful medicine.

*POLYGONUM*. *Persicaria*. 8  
—1. Calyx inferior, turbinate, colored, deeply divided into five egg-shaped, permanent segments; corolla none; filaments variable in number, awl-shaped, very short; anthers roundish; germen superior, roundish, triangular, or compressed; styles generally three, in some species two, thread-shaped, very short; stigmas simple; seed solitary, triangular, or compressed, pointed.

*P. BISTORTA*, *Great Bistort*, *Snake-weed*: stem simple, bearing a single spike; leaves egg-shaped, waved, running down into the foot-stalks; stems erect, about two feet high, leafy; flowers rose-colored; perennial; flowers in June; grows in pastures and meadows.

*P. VIVIPARUM*, *Alpine Bistort*: stem simple, bearing a single spike; leaves lance-shaped, revolute at the margin; stem from three to eight inches high, erect, leafy; flowers pale red; perennial; flowers in June

and July; grows on the White mountains.

*P. AVICULARE*, *Common Knot-grass*: flowers axillar; leaves lance-shaped, rough-edged; stem procumbent; stems several, decumbent, spreading in all directions; leaves alternate, stalked; flowers two or three together, reddish; annual; flowers in summer and autumn; grows in fields, waste places, by roads, &c.; common.

*P. FAGOPYRUM*, *Buck-wheat*: leaves between heart-shaped and arrow-shaped; stem nearly erect, without prickles; angles of the seeds equal; clusters many-flowered, paniced, spreading; flowers variegated with red, green and white. The seeds furnish a nutritious meal, from which are made the fashionable *Buck-wheat Cakes*. It is usual for farmers to sow a crop of buck-wheat, and plough it down for manure. Annual; flowers in July and August; grows in cultivated fields.

*P. CONVULVULUS*, *Black Bind-weed*: leaves between heart-shaped and arrow-shaped; stem twining, angular; segments of the calyx bluntly keeled; stem twining to the height of several feet; clusters loose, interrupted, leafy; flowers greenish-

white or reddish; annual; flowers from June to October; grows in corn-fields, gardens, and waste ground; common.

*P. AMPHIBIUM*, *Amphibious Persicaria*: styles two, united half-way up; stamens five; spike egg-shaped; leaves lance-shaped; stem round, leafy; leaves stalked, floating, minutely serrate, smooth, slightly heart-shaped at the base; flowers rose-red in beautiful dense spikes. When the plant grows out of the water, the leaves become narrower and hairy, and the stem shorter. Perennial; flowers in July and August; grows in ditches, ponds, and rivers; common.

*P. FERSICARIA*, *Spotted Persicaria*: styles two, united half-way up; stamens six; spikes dense, oblong, erect; stipules fringed; stem erect, branched, leafy; leaves lance-shaped, entire, shortly stalked, generally marked about the middle with a blackish spot; flowers rose-colored; annual; flowers in July and August; grows in ditches and wet fields; common.

*P. LAPATHIFOLIUM*, *Pale-flowered Persicaria*: styles two, distinct; stamens six; flower-stalks rough; stipules not fringed; stem about a foot high, branched, swelled above



the joints; leaves broadly lance-shaped, rough-edged, sometimes marked with a blackish spot; flowers reddish or pale green; annual; flowers in July and August; grows in cultivated ground.

*P. HYDROLYPER*, *Biting Persicaria*, *Water Pepper*: styles two, united half way up; stamens six; clusters loose, interrupted, drooping; stem erect; leaves lance-shaped, waved, without spots; stem two feet high, swelled above each joint, smooth; clusters terminal, long and slender; flowers pale green. The whole plant has an acrid, burning taste, which is supposed to reside in glandular dots sprinkled over it. Annual; flowers in September; grows among rubbish in moist grounds, in dry ditches, &c.

*PONTEDERIA*. 6—1.

*P. CORDATA*, *Pickersel-weed*: leaves cordate; flowers spiked; stem cy-



lindrical, erect; leaves large, long,

smooth, shining, of a bright green color, the veins toward the base curving so as to conform to its margin, giving it a peculiar and beautiful appearance; spike cylindrical, terminal; flowers blue; July; perennial. A beautiful plant, very common about our ponds and ditches.

*POPULUS*. Poplar. 22—6.

*P. ANGULATA*, *Carolina Poplar*: leaves cordate, deltoid, acuminate,



bluntly hook-toothed; branches winged, angular. The lower part of Virginia is the most northern point at which the Carolina poplar is found, and here it is less common than in the Carolinas, in Georgia and in Lower Louisiana. It grows of preference on the marshy banks of the great rivers which traverse these states, and is peculiarly abun-

dant on the Mississippi, from the ocean to the mouth of the Missouri, and along the Missouri for one hundred miles from the junction of these streams, which, in following their windings, is a distance of one thousand five hundred miles.

Among the numerous species of poplar of the United States, this is one of the most remarkable for its size, being sometimes eighty feet in height, with a proportional diameter, and an expansive summit garnished with beautiful foliage. The leaves, from the moment of their unfolding, are smooth and brilliant, but they differ widely in conformation at different ages of the plant: on sprouts and young stocks they are seven or eight inches long and as much in breadth in the widest part, heart-shaped and rounded at the base, with the principal ribs of a reddish color; on trees five or six inches in diameter, and thirty or forty feet in height, they are only one-fourth as large, particularly on the higher branches, and their base is nearly straight, and at right angles with a petiole. These leaves are thin, smooth, of a fine green tint, marked with yellowish nerves, and edged with obtuse teeth, which are fine towards the summit and

coarser near the base. The long petiole compressed in the upper part renders them easy to be agitated by the wind. On sprouts and young stocks the annual shoots are very thick, distinctly striated, and of a green complexion spotted with white; on branches of the second, third, and even to the eighth year, the traces of the furrows are still observable: they are indicated by prominent, red lines in the bark, terminating at the insertion of young shoots, which ultimately disappear with the growth of the branches. This character also belongs to the cotton tree, but, besides the difference of their general appearance, the two species are distinguished by their buds; those of the Carolinian poplar are short, of a deep green, and destitute of the resinous, aromatic substance which covers those of the cotton wood, and of which the vestiges remain till late in the season. The Carolinian poplar blooms in March or April.

The wood of this tree is white, soft, and considered unfit for use either for fuel or in the arts.

*P. CANADENSIS, Cotton Wood.* This tree grows in the upper part of the state of New York on the banks of the river Genessee, which

empties into lake Ontario, in some parts of Virginia, and on several islands of the Ohio. It is generally found on the margin of rivers in fat, unctuous soil, exposed to inundation at their overflowing in the spring.

On the banks of the Genessee, where the winter is rigorous, the cotton wood is seventy or eighty feet in height and three or four feet in diameter. The leaves are deltoid, or trowel-shaped, approaching to cordiform, always longer than they are broad, glabrous and equally toothed; the petioles are compressed and of a yellowish green, with two glands of the same color at the base; the branches are angular, and the angles form whitish lines, which persist even in the adult age of the tree. The female aments are six or eight inches long, flexible and pendulous. The seeds are surrounded with a beautiful plume, which has the whiteness of cotton, and the young buds are coated with a resinous, aromatic substance, of an agreeable odor.

This wood is assigned to no particular use in the arts or for fuel.

*P. ARGENTEA*, *Cotton Tree*. This species is scattered over a great extent of country, comprising the middle, western and southern states.

Near the junction of the Ohio with the Mississippi, Michaux mentions a swamp six miles in diameter, which is entirely covered with these trees.

The cotton tree is sometimes seventy or eighty feet in height and two or three feet in diameter. On trunks of these dimensions the bark is very thick and deeply furrowed. The young branches and annual shoots are round, instead of being angular like those of the Carolinian poplar and of the cotton wood. The leaves while very young are covered with a thick, white down, which gradually disappears, leaving them perfectly smooth above and slightly downy beneath. They are borne on long petioles, are often six inches in length and as much in breadth, of a thick texture, denticulated and heart-shaped, with the lobes of the base lapped so as to conceal the junction of the petiole. The aments are drooping, and about three inches long, as those of the Carolinian poplar. They put forth in the month of April.

The wood of the cotton tree is soft, light, unfit for use, and inferior to that of the white, the Virginian and the Lombardy poplars. The heart is yellowish, inclining to red,

and the young branches are filed with a pith of the same color. It is appropriated to no particular use in the arts or for fuel.

**P. CANDICANS**, *Balsam Poplar*, *Balm of Gilead*. In the states of Rhode Island, Massachusetts and New Hampshire, this tree, which is a genuine *Balsam Poplar*, is commonly seen growing before the houses, less as an ornament than as a shelter from the sun. It is not found in the forests of these states.

This tree attains the height of forty or fifty feet, with a diameter of eighteen or twenty inches. The trunk is clad in a smooth, greenish bark. The foliage is tufted, and of a dark green tint. The buds are covered in the spring with a resinous, balsamic substance, of an agreeable odor.

The wood of this tree is soft, light, and is appropriated to no use in the arts and is little esteemed for fuel.

**P. GRANDIDENTA'TA**, *American Large Aspen*. The American Large Aspen belongs rather to the northern and middle, than to the southern states, in the upper parts only of which it is found. North of the United States, this poplar, though not one of the most rare, is not one of

the most common trees, and it is so thinly scattered over the face of the country that sometimes not a single stock is met with by the traveller for several days. For this reason, probably, it has been confounded by the inhabitants with the American aspen, which is more multiplied: as it surpasses the aspen in height, we have given it the name of *Large Aspen*. It grows as favorably on uplands as on the borders of swamps.

This tree attains the height of about forty feet, with a diameter of ten or twelve inches. The trunk is straight, and covered with a smooth, greenish bark, which is rarely cracked. Its branches are few and scattered; they ramify and become charged with leaves only at their extremity, so that the interior of the summit is void, and of an ungrateful appearance. At their unfolding in the spring the leaves are covered with a thick, white down, which disappears with their growth, so that at the beginning of summer they are perfectly smooth. The full-formed leaf is nearly round, two or three inches in width, smooth on both sides, and bordered with large teeth, from which is derived the Latin specific name of *grandidentata*. The flowers, which put forth in

April, compose aments about two inches long, that appear in the infancy of the leaves, and that, at this period, are thickly coated with down. The wood is light, soft, and unequal to that of the Virginian and Lombardy poplars, and of little use.

*P. BETULIFOLIA, American Black Poplar.* This poplar is found principally on the banks of the river Hudson, above Albany, and in the Canadas, and is a stranger to the other parts of the United States.

This tree seldom surpasses the height of thirty or forty feet and a diameter of twelve or fifteen inches. The bark of the young branches is of a grayish white, and the buds, which spring from the bosom of the leaves, are of a dark brown. One of the distinctive characters of this species is the hairiness of the young shoots and of the petioles in the spring, which is perceptible, also, on the back of the young leaves. The leaves are smooth, of a beautiful green color, denticulated, rounded in the middle, and acutely tapering towards the summit. When fully developed they are a little more than three inches long, about two inches broad, and, unlike the leaves of trees in general, they exhibit nearly the same shape from the moment of

their unfolding. The aments are four or five inches long, and destitute of the hairs which surround those of several other species.

The wood of the American black poplar is inferior to that of the Virginian and Lombardy poplars, and consequently of little use.

*P. MONILIFERA, Virginian Poplar.* This poplar is indigenous to North America, though very rare, and is called *Virginian Poplar* and *Swiss Poplar*; the last of which denominations is owing only to its being abundantly multiplied in Switzerland. This tree is sixty or seventy feet high, with a proportional diameter. Its trunk is cylindrical, and not sulcated like that of the Lombardy poplar, and the bark upon old stocks is blackish. The leaves are nearly as long as they are broad, slightly heart-shaped, compressed towards the summit, obtusely denticulated and borne by long petioles. On large trees their mean length is from two and a half to three inches, but they vary in size, being twice as large on the lower limbs, and on young stocks growing in moist places. On trees equally vigorous and nourished by the same soil, the leaves of this species are observed to be only half as large as those of

the cotton wood and Carolinian poplar. This tree has been and is still confounded with the cotton wood; but the principal difference between them is that the leaves of the Virginian poplar are much smaller and less distinctly heart-shaped; the young shoots are smaller and less angular, and on high grounds those of the third year are even cylindrical; the limbs also diverge less widely from the trunk.

The wood of this tree is softer than that of the cotton wood, but its growth is more rapid, and it prospers in a less humid soil. It is appropriated to no particular use in the arts.

P. TREMULOIDES, *American Aspen*. This species of poplar is common in the northern and middle sections of the United States, and is profusely multiplied in Lower Canada: in the vicinity of New York and Philadelphia, it prefers open lands of a middling quality.

The American aspen is ordinarily about thirty feet in height and five or six inches in diameter. The bark of the trunk is greenish and smooth, except on the base of the oldest trees, where it becomes furrowed. The leaves are about two inches broad, narrowed at the summit, and

supported by long petioles; they are of a dark green color, and in the spring their nerves are reddish: on stocks seven or eight feet in height they are nearly round, and are bordered with obtuse, irregular teeth; on young shoots they are of twice this size, heart-shaped, and acuminate at the summit. Of all the American poplars this species has the most tremulous leaves; the gentlest air suffices to throw them into agitation. This tree blooms about the middle of April, about a fortnight before the birth of the leaves. The aments, which spring from the extremity of the branches, are composed of silky plumes, and are of an oval form and about two inches in length.

The wood of this tree is soft, light, destitute of strength and utility for timber or fuel. The wood is sometimes divided into laminæ for the fabrication of bats, which are much worn in the summer season.

The prim, perpendicular thing, so often met with about houses as an *ornamental tree*, is the *Lombardy Poplar*, or *Italian Poplar*, P. DILATATA. Its rapid growth is the only quality that can recommend it, as there is scarce a tree in the American forests with so few claims to

attention, either for shade or ornament.

**PORTULACA.** Purslane. 11—1.

**P. OLERACEA,** *Common Purslane*: leaves wedge-shaped, fleshy; flowers sessile; branches prostrate; stems much branched, spreading, smooth, succulent; flowers yellow; June to August; annual. A very common plant in gardens. It is a handsome weed, and has a place in our catalogue of greens.

**POTAMOGETON.** Pond-weed.

4—3. Calyx none; corolla inferior, of four roundish equal petals, furnished with a claw; filaments very short, flat; anthers oblong, two-lobed; germens four, superior, egg-shaped, acute; style none; stigmas obtuse, permanent; seeds four, roundish, bulging on one side, flattened on the other.

**P. NA'TANS,** *Floating Pond-weed*: upper leaves between oblong and egg-shaped, stalked, leathery, floating; lower leaves linear, membranous, sessile; stem round, much branched; upper leaves brownish-green; spikes simple, raised above the water. The floating leaves afford an agreeable shade to fish, and the roots are a favorite food of swans. Perennial; flowers in July and August.

**P. HETEROPHYLLUM,** *Various-leaved Pond-weed*: upper leaves elliptical, stalked, slightly leathery, floating; lower leaves lance-shaped, membranous, sessile; smaller than the last; upper leaves thinner; flower-stalks enlarged upwards; spikes dense; perennial; flowers in July and August; grows in pools, ditches and rivers.

**P. FLUTANS,** *Long-leaved, Floating Pond-weed*: upper leaves between egg-shaped and lance-shaped, stalked, leathery, floating; lower leaves lance-shaped, membranous, sessile; upper leaves less leathery, olive-colored or reddish; perennial; flowers in July and August; grows in ditches, ponds, and slow rivers.

**P. TERFOLIA'TUM,** *Perfoliate Pond-weed*: leaves heart-shaped, embracing the stem, uniform, all submersed; leaves all sessile, uniform, very pellucid, olive-colored; perennial; flowers in July and August; grows in slow rivers and ponds; very common.

**P. LUCENS,** *Shining Pond-weed*: leaves between elliptical and lance-shaped, pointed, stalked, membranous, sessile; spike dense, many-flowered; leaves large, olive-green, with undulated margins, and beautifully veined; spike two inches

long, of very numerous, green flowers; perennial; flowers in June and July; grows in ditches, ponds, and slow rivers; common.

*P. CRISFUM, Curled Pond-weed*: leaves lance-shaped, waved, serrate, alternate, the upper opposite; leaves sessile, bright green; flowers yellowish green, in short, loose spikes; perennial; flowers in June and July; grows in ditches, pools and rivulets.

*P. COMPRES'SUM, Flat-stalked Pond-weed*: leaves linear, obtuse; stem flattened; leaves sessile, alternate; flowers brownish, in short spikes; perennial; flowers in June and July; grows in ditches and slow streams.

*P. GRAMINEUM, Grassy Pond-weed*: leaves linear, tapering towards the base, alternate, sessile; stem round, forked; flower-stalks little longer than the stalks; leaves bright green, grassy-looking; spikes egg-shaped, dense; perennial; flowers in July; grows in ditches and streams.

*P. PECTINATUM, Fennel-leaved Pond-weed*: leaves bristle-shaped, one-ribbed, parallel, closely set in two rows; leaves alternate, bright green; spikes few, with interruptions; perennial; flowers in July; grows in ditches, pools and rivers. All the species are rather curious plants.

*POTENTILLA. Cinquefoil. 12* —3. Calyx inferior, of one leaf, with ten segments, of which five alternate ones are external and narrower; petals five, roundish, spreading; filaments awl-shaped, erect, shorter than the corolla; anthers roundish, two-celled; germens superior, numerous, roundish, collected into a round head; styles one to each germen, thread-shaped, lateral, ascending; stigmas bluntish, downy; seeds numerous, naked, roundish, upon the surface of a small, dry, globular receptacle.

*P. ANSERINA, Silver-weed, Goose-grass, Wild Tansy*: leaves inter-



ruptedly pinnate, serrate, silky; stem creeping; stalks axillar, solitary, one-flowered; root long, cylindrical; leaves interruptedly pinnate, covered beneath with shining white



hairs; flowers large, bright yellow; perennial; flowers in June and July; grows by the sides of roads and ditches, and in meadows and pastures.

*P. FLORIBUNDA*, *Bushy Potentilla*: leaves pinnate; leaflets five, linear-oblong, sessile, revolute at the edges, hairy underneath; petioles short; corymbs terminal; stem about a foot high; flowers yellow; July to October; grows in moist grounds.

*P. FRUTICOSA*, *Shrubby Cinquefoil*: leaves pinnate; stem woody; stem three or four feet high; leaves of five acute, oblong leaflets, covered with close hairs, venter beneath; the upper leaves ternate; flowers terminal, large, golden yellow; perennial; flowers in June; grows in thickets.

*P. ARGENTEA*, *Silvery or Hoary Cinquefoil*: leaflets five, wedge-shaped, jagged, downy beneath; stem ascending; stems nearly erect, from six to twelve inches high, cottony; leaves stalked, cottony beneath; flowers small, yellow, in a corymbose panicle, with cottony branches; seeds numerous, small, smooth; perennial; flowers in June and July; grows in gravelly pastures.

*P. ORACA*, *Saw-leaved Hairy Cinquefoil*: root-leaves of seven hairy, narrow wedge-shaped leaflets, deeply serrate throughout; stem-leaves ternate; petals heart-shaped; stems slender, decumbent; roots woody; stems hairy; root-leaves on long hairy stalks; calyx hairy; petals about the length of the calyx, bright yellow, orange at the base; perennial; flowers in July.

*P. TRIDENTATA*, *Three-toothed Cinquefoil*: leaves ternate; leaflets wedge-shaped, with three terminal teeth, smooth above, hairy beneath; stem panicled, erect; root woody, creeping; stems three or four inches high, round, hairy; leaves all ternate; petals inversely egg-shaped, white; perennial; flowers in June; grows on mountains.

*P. SARMENTOSA*, *Running Cinquefoil*: leaves pinnate; leaflets five, obovate, coarsely serrate, smooth above, hairy beneath; stipules cut, bifid; peduncles one-flowered, axillary; stem producing runners; flowers bright yellow; May. A very pretty little plant, very common in pastures.

This genus comprises several species, generally of beautiful, delicate plants, somewhat resembling the

strawberry. One or another of the family are to be met with everywhere. Some are called *Five-fingers*.

**PRUNEL'LA.** Self-heal. 14—  
1. Calyx bell-shaped, two-lipped; upper lip flat, dilated, abrupt, with three very short, acute teeth; lower lip much narrower, straight, divided into two acute segments; corolla gaping; tube short, cylindrical; throat longer and wider; upper lip concave, entire, inflexed; lower lip reflected, divided into three obtuse crenate lobes, the middle one broader; filaments directed toward the upper lip, awl-shaped, forked at the top; anthers on the lower branch of the filaments; germen four-lobed; style thread-shaped, as long as the stamens; stigma divided into two acute, recurved points; seeds four, oval, in the bottom of the closed calyx.

**P. PENNSYLVANICA,** *Heal-all, Self-heal*: leaves stalked, ovate, lanceolate, toothed at the base; lips of the calyx equal, upper one truncate with three awns; stem ascending; all the leaves between oblong and egg-shaped, stalked; teeth of the upper lip of the calyx very minute; stem from four to eight inches high, erect, leafy, downy, branched below, ter-

minating in dense whorled spikes, of deeply purple flowers, each whorl



with two broad obtuse bracteas; perennial; flowers in July and August; introduced; grows in meadows and pastures.

**PRUNUS.** Plum and Cherry. 12—1.

**P. VIRGINIANA,** *Wild Cherry*: flowers racemose; racemes erect; leaves deciduous, doubly toothed, smooth; stalks with four glands. This is one of the largest productions of the American forest. In the state of Maine, where the winter is long and intense, it hardly exceeds thirty or forty feet in height, and from eight to twelve inches in diameter; in the southern and maritime parts of the Carolinas and of Georgia, where the summer is intemperately hot and where the soil

is generally arid and sandy, it is rarely seen, and on the banks of



rivers, where the ground is too wet, its dimensions are stunted; but in the upper parts of these states it is sufficiently common, though less multiplied than in Virginia and Pennsylvania.

On the banks of the Ohio, this tree grows to the stature of eighty to a hundred feet with a circumference of twelve to sixteen feet, with a trunk of a uniform size and undivided to the height of twenty-five or thirty feet. Its bark is so peculiar as to render it distinguishable at first sight, when from its height the form of its leaves cannot be discerned. The trunk is regularly shaped, but the bark is blackish and rough, and detaches itself semi-

circularly in thick, narrow plates, which are renewed after a considerable lapse of time. The leaves are five or six inches long, oval-acuminate, denticulated, of a beautiful brilliant green, and furnished at the base with two reddish glands. It puts forth white flowers in May or June, collected in spikes, which have a beautiful effect. The fruit is about the size of a pea, disposed in the same manner as the flowers, and nearly black at its maturity, which is in August or September; soon after which, notwithstanding its bitterness, it is devoured by the birds.

The perfect wood is of a dull, light-red tint, which deepens with age. It is compact, fine-grained and brilliant, and not liable to warp when perfectly seasoned. It is extensively employed by cabinet-makers for every species of furniture; and when chosen near the ramification of the trunk it rivals mahogany in beauty. This wood is generally preferred to the black walnut, whose dun complexion with time becomes nearly black. On the banks of the Ohio it is employed in ship-building, and the French of Illinois use it for the felloes of wheels. The fruit is employed to make a cordial, by in-

fusion in rum or brandy, with the addition of a certain quantity of sugar. The bark of this tree is bitter and aromatic, its taste being strong, penetrating, and not disagreeable. It is undoubtedly a useful tonic, and appears to possess, in some degree, a narcotic and antispasmodic property. The latter quality is strongest in the recent state, and in the distilled water. The powdered bark may be given in doses of from ten to fifteen grains. This tree probably contains prussic acid.

*P. SERRATINA, Choke Cherry, Bird Cherry:* flowers in loose racemes; leaves deciduous, sharply serrated, obovate, smooth; lower serratures glandular; ribs bearded toward the base. A small tree or shrub, very common in some places about walls and roads. The fruit is abundant, of a reddish color, not unpleasant to the taste, though astringent and slightly bitter.

*P. BORBALEA, Red Cherry.* The Red Cherry Tree is common only in the northern states and in Canada, New Brunswick and Nova Scotia.

The size of the red cherry tree places it among trees of the third order: it rarely exceeds, and often does not equal, twenty-five or thirty feet in height and six or eight inches

in diameter. The trunk is covered with a smooth, brown bark, which detaches itself laterally. Its leaves are five or six inches long, oval, denticulated and very acuminate. Its flowers put forth in May or June, and are collected in small, white bunches, and give birth to a red fruit of an inconsiderable size, which is ripe in the month of July. This fruit is intensely acid, and is not abundant even on the largest trees. The wood is fine-grained and of a reddish hue; but the inferior size of the tree forbids its use in the mechanic arts.

*P. CAROLINIANA, Wild Orange.* This beautiful species of the cherry tree is found on the Bahama isles, and on the continent of North America it appears to be nearly confined to the islands on the coast of the Carolinas, of Georgia and of the Floridas. Except the margin of the sea, it is rarely found on the mainland, even at the distance of eight or ten miles from the shore.

The wild orange grows to the height of twenty or thirty feet, and ramifies at a small height, and forms a spacious and tufted summit, which is owing, perhaps, to its growing upon open grounds instead of being compressed in the forest,

and forced to shoot upward in order to enjoy the light. The bark of the trunk is of a dun complexion, and is commonly without cracks. Its leaves are oval-acuminate, evergreen, smooth and shining on the upper surface, and about three inches in length. Its flowers open in May, are numerous, white, and arranged in little bunches an inch or an inch and a half long, which spring at the base of the leaf. The fruit is small, oval, and nearly black: it consists of a soft stone surrounded with a small quantity of green pulpy substance, which is not eatable. This fruit persists through a great part of the following year, so that in the spring the tree is laden at the same time with fruit and flowers. This tree may be considered as one of the most beautiful vegetable productions of this part of the United States, and it is selected with the more reason by the inhabitants to plant about their houses, as it grows with rapidity and affords an impenetrable shade. The perfect wood is rose-colored and very fine-grained; but as this species is not extensively multiplied it is not much used: there is the less occasion for it, as other wood, in no respect inferior,

is procured with facility. In the bark of the roots there is a strong odor resembling that of the wild cherry stone, from which a fragrant, spirituous liquor may be obtained.

*P. LITTORALIS*, *Beach Plum*: described in Bigelow's "Plants of Boston and its Vicinity." A small shrub, very abundant on some of our beaches, bearing an agreeable pulpy fruit, little inferior to the garden plum.

Among the other plants of this genus, are *P. DOMESTICA*, considered the original of the common garden plum, and *P. ARMENIACA*, *Common Apricot*.

#### PYCANTHEMUM. 14--1.

*P. INCA'NUM*, *Wild Basil*: stem pubescent; leaves petioled, oval,



acuminate, serrate, white with down; heads compound, terminal and lateral; bractees setaceous; stem two or three feet high; flowers white; July to September; grows on woody hills; perennial.

**PYR'OLA.** Winter-green. 10—  
 1. Calyx inferior, of one leaf, permanent, deeply divided into five rounded segments; petals five, roundish, spreading; filaments awl-shaped, curved, shorter than the corolla; anthers large, pendulous, two-celled, each opening by a round pore at the top; germen superior, roundish, five-lobed; style thread-shaped, longer than the stamens, permanent; stigma thickened, somewhat notched; capsule globular, depressed, five-cornered, five-celled, five-valved; seeds very numerous, minute, oval, each in a membranous coat.

**P. ROTUNDIFOLIA,** *Round-leaved Winter-green*: stamens ascending;



style twice as long, declining and recurved; leaves nearly round, ob-

scurely crenate; flower-stalk about eight inches high, triangular, terminating in an oblong, erect cluster of numerous, white, fragrant flowers; perennial; flowers in June; grows in woods.

**P. ASARIFOLIA,** *Round-leaved Winter-green*: leaves prolate, orbicular; flowers racemed; calyx reflexed; style declined; stem ascending, angular; leaves spreading near the ground, roundish; raceme terminal; flowers white, fragrant; June; grows in woods.

**P. UNIFLORA,** *Single-flowered Winter-green*: stalk single-flowered; root creeping; stems reclining, an inch or two long, simple; leaves egg-shaped, acute, sharply serrate; stalk about three inches long, erect, bearing a single, large, white, fragrant flower; perennial; flowers in July; according to Bigelow, grows in a wood at Keene, New Hampshire.—All the species are powerfully astringent and tonic.

**PYRUS.** 12—5. Calyx superior, of one leaf, deeply divided into five permanent segments; petals five, roundish, much larger than the calyx, and arising from its edge; filaments awl-shaped, shorter than the corolla; anthers oblong, two-lobed; germen inferior, roundish;

styles from two to five, thread-shaped, as long as the stamens; stigmas simple; apple roundish or oblong, pitted at the top, fleshy, with as many bivalve membranous cells as there are styles; seeds two in each cell, inversely egg-shaped, flattened on one side.

*P. ARBUTIFOLIA*, *Choke-berry*: leaves obovate, crenate, toothed, downy beneath; rachis glandular above; calyx downy; stem small, branched; flowers white; May, June. A small shrub, common in swamps, where it reaches the height of four feet, and low woods and pastures, where it is generally much smaller. Fruit not unpleasant to the taste, but very astringent.

In this genus is found the *Apple*, *P. MALUS*, and the *Pear*, *P. COMMUNIS*.

## Q.

*QUERCUS*. Oak. 21—7. Barren flowers in a loose catkin, deciduous; calyx a scale of one leaf, deeply divided into several segments; corolla none; filaments eight or more, awl-shaped, short; anthers roundish, two-lobed.

Fertile flowers in separate catkins; calyx double, the outer infe-

rior, hemispherical, leathery, one-flowered, entire, becoming enlarged and externally scaly or tuberculated; the inner superior, of one leaf, with six minute, downy segments, closely surrounding the base of the style; corolla none; germen one, below the inner calyx, globular, three-celled, with rudiments of six seeds; nut solitary, oval, leathery, one-celled; kernel solitary, rarely two.

*Q. ALBA*, *White Oak*: leaves oblong, deeply pinnatifid, smooth;



lobes linear-oblong, obtuse, entire, dilated upwards; fruit stalked; cup bowl-shaped, warty; acorn ovate. Throughout the United States and Canada this tree is known by the name of *White Oak*. It abounds chiefly in the middle states, particularly in that part of Pennsylvania and Virginia which lies between the Alleghanies and the Ohio, a distance of about one hundred and fifty miles,

where nine-tenths of the forests are frequently composed of these trees, whose healthful appearance evinces the favorable nature of the soil. East of the mountains this tree is found in every exposure, and in every soil which is not extremely dry or subject to long inundations; but the largest stocks grow in humid places. In the western districts, where it composes entire forests, the face of the country is undulated, and the yellow soil, consisting partly of clay with calcareous stones, yields abundant crops of wheat.

The white oak attains the elevation of seventy or eighty feet, with a diameter of six or seven feet; but its proportions vary with the soil and climate. The leaves are regularly and obliquely divided into oblong, rounded lobes, destitute of points: the sections are deepest in the moist humid soils. Soon after unfolding, the leaves are reddish above and white and downy beneath; when fully grown they are smooth and of a light green on the upper surface and glaucous beneath. In autumn they change to a bright violet color, and form an agreeable contrast with the surrounding foliage which has not yet suffered by

the frost. This is the only oak on which a few of the dried leaves remain till the circulation is renewed in the spring. By this peculiarity, and by the whiteness of its bark, from which it derives its name, it is easily distinguishable in the winter. This tree puts forth flowers in May, which are succeeded by acorns of an oval form, large, very sweet, contained in rough, shallow, grayish cups, and borne singly or in pairs, by peduncles eight or ten lines in length, attached, as in all species of annual fructification, to the shoots of the season. The fruit of the white oak is rarely abundant, and frequently, for several years in succession, a few handfuls of acorns could hardly be collected in a large forest where the tree is multiplied. Some stocks produce acorns of a deep blue color.

The bark of the trunk of the white oak is frequently variegated with large, black spots. On stocks of less than sixteen inches in diameter the epidermis is divided into squares; on old trees, growing in moist grounds, it is in the form of plates laterally attached. The wood is reddish, and very similar to that of the European oak, though lighter and less compact: in the American



species the vessels which occupy the intervals of the concentric circles are visibly less replete. But of all the American oaks, this is the best and the most generally used, being strong, durable, and of large dimensions. It is less employed than formerly in building, only because it is scarcer and more costly. The excellent properties of this wood cause it to be preferred for a great variety of uses, among which are many articles manufactured by the wheelwrights. White oak perfectly seasoned is employed for the frames of coaches, wagons and sledges, for the mould-boards of ploughs, the felloes, spokes and naves of wheels. The wood of the young stocks is very elastic and is susceptible of minute division; hence it is preferred for large baskets used in harvesting, for the hoops of sieves, the bottoms of riddles and the handles of coach whips, for pail handles and axe helves. In many parts of the middle states, the white oak is selected for the posts of rural fence. The bark is considered by many tanners as the best for preparing leather for saddles and other similar objects; it is little employed, however, because the bark of the trunk and large limbs only is used, and

on these the cellular integument is much thinner in the white than in the red and black oaks. Among the uses of this wood the most important is in ship-building. In all the dock-yards of the northern and middle states except Maine, it is almost exclusively employed for the keel, and always for the lower part of the frame and the sides: it is preferred for the knees when sticks of a proper form can be found. In the smaller ports south of New York, the upper part of the frame is also made of white oak; but such vessels are less esteemed than those constructed of more durable wood. The medicinal properties of oak bark depend on its astringency, and that again on its tannin. The inner bark of the small branches is the strongest, the middle bark next, and the outer bark is almost useless.

*Q. AMBIGUA, Gray Oak.* This oak abounds in the northern states and in Canada. In favorable situations it attains the height of fifty or sixty feet, with a diameter of fifteen or eighteen inches. The leaves are large, smooth, and deeply sinuated at right angles to the main rib. The flowers put forth in the month of May, which are succeeded by acorns of a middle size, rounded

at the end, and contained in scaly cups. The wood of the gray oak is similar to that of the other species included under the common name of *Red Oak*. Its coarse and open texture renders it unfit for any use except to contain dry wares; but in districts where oak wood is rare, recourse is had for other purposes to several species of inferior quality, which are still preferred to the birch, the beech and the pine. Thus the gray oak is employed for the knees of vessels and for cartwright's work; it is even preferred to that of the red oak, as being stronger and more durable.

*Q. AQUATICA, Water Oak.* This is an oak of the middle and southern



states. It rarely exceeds forty or forty-five feet in height and twelve or eighteen inches in diameter. On full-grown trees the leaves are smooth, shining, and heart-shaped or broad and rounded at the sum-

mit, and terminated in an acute angle at the base. In the severe climate of Virginia they fall with the first frost, but on the sea-shore of the Carolinas, Georgia, and Florida, they persist during two or three years. There is no oak in the United States of which the foliage is so variable, and so different from that of the tree; on the young stocks and on the spreets from an old trunk or from the base of a limb that has been lopped: the leaves are commonly oval and deeply and irregularly toothed. The flowers appear in the month of May, and are followed by acorns, which are contained in shallow, slightly scaly cups; they are brown, small and extremely bitter. This tree fructifies once in two years.

The bark upon the oldest trunks of the water oak is smooth and very slightly furrowed; it is little used in tanning, either because it is inferior to that of the Spanish oak, or because the tree is less abundant. The wood is very tough, but less durable and less esteemed by carpenters and wheelwrights than that of the white oak and chesnut white oak.

*Q. BANISTERI, Bear Oak, Black Scrub-Oak, Dwarf Oak.* This shrub

is common throughout the United States. It is seldom found insulated or mingled with other trees in the forests, but always in tracts of many acres, which it covers almost exclusively. Its ordinary height is three or four feet; but when accidentally insulated and nourished by a vein of more fertile soil, it sometimes equals eight or ten feet. It usually grows in compact masses, which are traversed with difficulty, though no higher than the waist. As the individuals which compose them are of a uniform height, they form so even a surface that at a distance the ground appears to be covered with grass instead of shrubs. The stem, which is numerously ramified, is covered, like the branches, with a polished bark. It has more strength than would be supposed from its size, which is rarely more than an inch in diameter. The leaves are of a dark green color on the upper surface, whitish beneath, and regularly divided into three or five lobes. The flowers appear in May, and it fructifies once in two years. The acorns are small, blackish, and longitudinally marked with a few reddish lines; the kernel is of a beautiful reddish orange color; they are so abundant as sometimes

to cover the branches: the lowly stature of the shrub renders it easy for bears, deer and swine to reach them by lifting their heads or rising on their hinder feet.

The presence of this oak is considered as an infallible index of a barren soil, and it is usually found on dry, sandy land mixed with gravel. It is too small to be adapted to any use in the arts or for fuel. It might probably be usefully adopted in the northern states for hedges, which might be formed by sowing the acorns in furrows from twenty to twenty-four inches thick, which in a few years would be sufficient to prevent the passage of horses and cattle.

Q. CINERA, *Upland Willow Oak*. The Upland Willow Oak is confined to the maritime parts of the southern states. In the pine-barrens this tree is eighteen or twenty feet high, and four or five inches in diameter. The leaves are two and a half inches long, entire, and whitish beneath; on the islands and on the shore of the continent, where the soil is extremely dry, they are only three or four feet in height, and the leaves are denticulated, are an inch in length, and persist for two years. Its fructification is biennial, and it

flowers in the month of May. The acorns, which are contained in shallow cups, are round and blackish, with the base of a bright rose color when freshly exposed.

Q. CATESBEI, *Barrens Scrub-Oak*. This oak abounds in the pine-barrens of the Carolinas and Georgia. Its ordinary height is twenty or twenty-five feet, with a diameter of six or eight inches. Its foliage is open, and its leaves are large, smooth, thick and coriaceous towards the close of summer, deeply and irregularly lacinated, and supported by short petioles. With the first frost they change to a dull red, and fall the ensuing month. It blooms in May, and fructifies once in two years. The acorns are pretty large, of a blackish color, and partly covered with a fine, gray dust, which is easily rubbed off between the fingers: they are contained in thick cups, swollen towards the edge, with the upper scales bent inwards.

Q. COCCIN'EA, *Scarlet Oak*. The Scarlet Oak is first seen in the vicinity of Boston, but is less multiplied than in New Jersey, Pennsylvania, Virginia, and the upper part of the Carolinas and Georgia, where it forms a part of the forests that are still standing. It is a stranger

to Maine, New Hampshire and Vermont. In the northern states it is confounded with the red oak, and in those of the south, with the Spanish oak.

This is a vegetable of more than eighty feet in height and of three or



four feet in diameter. The leaves, which are supported by long petioles, are of a beautiful green, shining on both sides, and lacinated in a remarkable manner, having usually four deep sinuses, very broad at the bottom. They begin to change with the first cold, and, after several successive frosts, turn to a bright scarlet color, instead of a dull hue like those of the red oak. At this season the singular color of the foliage forms a striking contrast with that of the surrounding trees, and

is itself a sufficient inducement to cultivate the tree for ornament. It flowers in May, and fructifies once in two years. The acorns are large, somewhat elongated, similarly rounded at both ends, and half covered with scaly cups. As this fruit varies in size with the quality of the soil, it is difficult to distinguish it from the black oak; the only constant difference is in the kernel, which is yellowish in the black oak and white in the species which we are now considering.

The bark of the scarlet oak is very thick, and generally employed in tanning; though it is in no respect preferable to that of the gray and red oaks. The wood of this tree is reddish and coarse-grained, with open pores. As it decays much more rapidly than the white oak, it is employed by the builder and wheelwright only for necessity or economy. It is poor fuel, and is used principally for staves. In the middle states, a large part of the *red oak staves* are furnished by this species. From this tree are obtained those excrescences which afford the galls of commerce.

*Q. FALCATA, Spanish Oak.* This oak abounds in the middle and southern states. It is more than

eighty feet in height, and four or five feet in diameter. The leaves are very different on different individuals; thus in New Jersey, where the tree is only thirty feet high and four or five inches thick, they are three-lobed, except a few on the summit, and not falcated as on the large stocks in the southern states. On young plants, and on the lower branches of the most vigorous stocks growing in moist and shaded situations, they are also trilobed; and on the upper limbs they are more acutely laciniated, with the sections more anching. One of their constant characters is a thick down upon the lower side of the leaves, and upon the young shoots to which they are attached. This tree fructifies once in two years. Its flowers put forth in May, and are succeeded by small, round acorns, of a brown color, and contained in slightly scaly, shallow cups, supported by peduncles one or two lines in length. They resemble those of the bear oak, and, like them, preserve for a long time the capability of germination.

The bark upon the trunk of the Spanish oak is blackish and deeply furrowed, with a cellular integument of middling thickness. The

wood is reddish and coarse-grained, with empty pores, and all the characteristic properties of the species known in commerce by the general name of *Red Oak*: hence its staves are fit only to contain molasses, salted provisions and dry goods. From its want of durability, this oak is less esteemed than the white oak, the post oak, and other species of annual fructification. It is rarely employed in building, and is used by cartwrights in preference to white oak for the felloes of large wheels. Its bark is preferred to that of most other species for tanning coarse leather, which it renders whiter and more supple; the leather is said to be improved by the addition of a small quantity of the bark of the hemlock spruce.

*Q. FERRUGINEA*, *Black Jack Oak*: common in the middle and southern



states. It is sometimes thirty feet high and eight or ten inches in dia-

meter, but commonly does not exceed half these dimensions. Its trunk is generally crooked, and is covered with a very hard, thick and deeply furrowed bark, of which the epidermis is nearly black, and the cellular integument of a dull red. The summit is spacious even in the midst of the woods. The leaves are yellowish, and somewhat downy at their unfolding in the spring; when fully expanded they are of a dark green above, rusty beneath, thick, coriaceous, and dilated towards the summit like a pear. In autumn they turn reddish, and fall with the earliest frost. This tree fructifies once in two years. The flowers are put forth in the month of May, and are succeeded by large acorns, half covered with scaly cups.

When the stock of this tree is more than eight inches in diameter, the wood is heavy and compact; but coarse-grained and porous before it has reached this size. As it speedily decays when exposed to the weather, it is not used in the arts, but it forms excellent fuel.

*Q. IMBRICARIA*, *Laurel Oak*: common in the western states. It is forty or fifty feet high, and twelve or fifteen inches in diameter. Its trunk, even when old, is clad in a

smooth bark, and, for three-fourths of its height, is laden with branches. It has an uncouth form when bared in winter, but is beautiful in the summer, when clad with its thick, tufted foliage. The leaves are long,



lanceolate, entire, of a light, shining green, and pubescent beneath. It flowers in the month of May, and is succeeded by acorns of a sub-globose form. It fructifies once in two years.

The wood is hard and heavy, though its pores are open. As the trunk is branchy and often crooked, it is considered as fit only for fuel on the eastern side of the mountains. In the country of Illinois, where it attains much greater dimensions, it is employed for shingles, probably for the want of a better species, for the wood is inferior to that of the

willow oak, which it nearly resembles.

*Q. LYRA'TA, Over-cup Oak:* common in the southern states. This oak expands to a majestic size, and the influence of a deep and constantly humid soil is shown in the luxuriance of its vegetation. On the banks of the Savannah it attains the elevation of eighty feet, with a circumference of eight to twelve feet. The leaves are six or eight inches long, smooth, narrow, lyre-shaped, deeply sinuated, and borne by short petioles. The lobes, particularly the two upper ones, are truncated, and from their resemblance in this respect to those of the post oak is derived the name of *Swamp Post Oak*. The foliage is thick, and of a light, agreeable tint. It fructifies annually, and flowers in the month of May. The acorns, unlike those of the oaks in general, which are of an elongated, oval shape, are broad, round and depressed at the summit: they are sometimes from twelve to eighteen lines from the base to the summit. The cup, which is nearly closed, is thin, and its scales are terminated by short, firm points. The bark upon the trunk is white, and the wood, though inferior to that of the

white oak and the post oak, is more compact than would be supposed from the soil in which it grows; the pores are observable only between the concentric circles, and are more regularly disposed than in other trees.

**Q. MACROCAR'PA**, *Over-cup White Oak*. This interesting species is most multiplied beyond the Alleghanies, in the fertile districts of Kentucky and West Tennessee, and in Upper Louisiana near the Missouri. It is called by the Americans *Bar Oak* and *Over-cup White Oak*. It is a beautiful tree, more than sixty feet in height, laden with a dark, tufted foliage. The leaves are larger than those of any other oak in the United States, being frequently fifteen inches long and eight broad: they are notched near the summit, and deeply lacinated below. It fructifies annually, and flowers in May. The acorns, which are also larger than those of any other American species, are oval, and inclosed for two-thirds of their length in a thick, rugged cup, bordered with fine, flexible filaments. Sometimes, however, in compact forests, or in very temperate seasons, the filaments do not appear, and the edge of the cup is smooth

and bent inwards. The fructification of this tree is not abundant, and as its wood is inferior to that of the white oak, it is little esteemed in the United States.

**Q. OBTUSILO'BA**, *Post Oak*, *Box White Oak*, *Iron Oak*: common



in the middle and southern states. It rarely exceeds forty or fifty feet in height, with a diameter of fifteen inches. Its summit, even when compressed in the forests, is disproportionately large, owing probably to an early division of the trunk into several limbs, with which the secondary branches form more open angles than is common on other trees. The branches are also bent into elbows at certain distances, which give so peculiar an appearance to the tree that it is easily distinguished when the leaves are fallen. The bark upon the trunk is thin, and of a grayish white. The leaves are borne by short petioles, and are



divided into four or five rounded lobes, of which the two nearest the summit are broadest; they are coriaceous, of a dusky green above and grayish beneath. Toward autumn the ribs are of a rosy tint, instead of a purplish red like those of the scarlet oak. The fructification is annual, and seldom fails. It puts forth flowers in May, which are followed by small, oval acorns, covered for a third of their length with a slightly rugged, grayish cup. They are very sweet, and form a delicious food for squirrels and wild turkeys; hence the tree is sometimes called *Turkey Oak*.

The wood of this tree is yellowish, with no tint of red. Growing upon a less humid soil, it is less elastic, but finer-grained, stronger and more durable, than the white oak: hence it is preferred for posts, and it is used with advantage by wheelwrights and coopers. In ship-building it is used principally for the knees, and is admitted into the lower part of the frame. It rarely furnishes side planks or timber of considerable length; for this reason it is less esteemed than the white oak. The staves made of this tree are preferable to those of the white oak.

Q. OLIVÆFORMIS, *Mossy-cup Oak*.

This species is very rare and little known except in the state of New York on the banks of the Hudson above Albany, in Genessee, and in the northern part of Pennsylvania. This tree is sixty or seventy feet in height, with a spacious summit and an imposing aspect. The bark is white and laminated; but the tree is chiefly remarkable for the form and disposition of its secondary branches, which are slender, flexible, and always inclined towards the earth. Its leaves are of a light green above and whitish beneath; they resemble those of the white oak in color, but differ from them in form, being larger, and very deeply and irregularly lacinated, with rounded lobes so various in shape that it is impossible to find two leaves that are alike. Its fructification is annual. The flowers appear in May, and are succeeded by acorns of an elongated, oval form, and are inclosed in cups of nearly the same configuration, of which the scales are prominent and recurved, except near the edge, where they terminate in slender, flexible filaments: from this peculiarity is derived the name of *Mossy-cup Oak*. The wood of this tree is not better than that of the white oak,

though far superior to that of the red oak.

*Q. PALUSTRIS*, *Pin Oak*. This species is found in Massachusetts,



but is less common than in the vicinity of New York, in New Jersey, Pennsylvania and Maryland. It is abundant beyond the mountains, in Ohio, East Tennessee and the country of the Illinois. It is said not to exist in Maine, Vermont and the southern states. It is a tall tree, which grows constantly in moist places, and of preference about the swamps inclosed in the forests. In these situations it is frequently more than eighty feet high and three or four feet in diameter. Its secondary branches are more slender and more numerous than is common in so large a tree, and are intermingled

so as to give it at a distance the appearance of being stuffed. This singular disposition renders it distinguishable at first sight in the winter. These small limbs die as the tree advances, which gives the tree the appearance of having pins or trunnels driven into it: whence the name of *Pin Oak*. The leaves are smooth, of a pleasing green, supported by long petioles, deeply laciniated, and very similar to those of the scarlet oak, from which they differ principally in their proportions. This tree fructifies once in two years. The flowers put forth in the month of May, and are succeeded by small, round acorns, contained in flat, shallow cups, of which the scales are closely applied one upon another.

The bark upon the oldest trunk is scarcely cracked, and consists almost wholly of a very thick, cellular integument. The wood is coarse-grained, with the pores open and larger than those of the scarlet and red oaks: though stronger and more tenacious than those species, it is little esteemed for durability. It is used for the axletrees of mill wheels when white oak of sufficient dimensions cannot be procured; it is also sometimes, though rarely,

made into staves, as the species is little multiplied compared with the scarlet, red and black oaks.

**Q. PHÆLOS, Willow Oak:** common in the middle and southern states. It grows in cool, moist places on the borders of swamps. In favorable situations, it attains the height of fifty or sixty feet, with a diameter of twenty or twenty-four inches. The trunk, even at an advanced age, is covered with a smooth bark, remarkable for the thickness of its cellular integument. The leaves are two or three inches long, of a light green, smooth, narrow, entire, and similar to those of the willow, whence is derived the name of *Willow Oak*, which is used in every part of North America where the tree is known. This tree fructifies once in two years. It flowers in May, and bears acorns of a dark brown color, which are small, bitter, and contained in shallow cups slightly coated with scales.

The wood is reddish and coarse-grained. It is too porous to contain wine or spirituous liquor, and its staves are classed with those of red oak. The quantity, however, is small, as the tree is so little multiplied that alone it would not supply the consumption for two years. It

possess great strength and tenacity, and splits more readily than the white oak; hence, after being thoroughly seasoned, it is employed for the felloes of wheels. These are the principal uses to which it seems adapted, and for these it is less proper than the post oak and white oak. It is sometimes employed in Georgia for fencing the plantations, and lasts only eight or nine years. As fuel it is very little esteemed.

**Q. PRÏNUS ACUMINATA, Yellow Oak:** common in the middle and western states. It is a fine tree, seventy or eighty feet high and two feet in diameter, with branches tending rather to close round the trunk than to diffuse themselves horizontally. The bark upon the trunk is whitish, very slightly furrowed, and sometimes divided into plates, like that of the swamp white oak. The leaves are lanceolate, regularly toothed, of a light green above and whitish beneath. It fructifies annually, and blooms in the month of May. The acorns are contained in scaly cups, and are sweeter than those of any other species in the United States.

The wood of this tree is yellowish, though the tint is not bright enough to fit it for peculiar uses. Its pores

are partly obliterated, irregularly disposed, and more numerous than those of any other American oak: this organization must impair the strength, and render it less durable than the chesnut white oak and the rock chesnut oak. As this tree is so thinly disseminated, it has not been appropriated to any particular use in the arts.

*Q. PRINUS CHINQUAPIN, Small Chesnut Oak*: a curious but rare shrub, found in the northern and middle states. This species, and another, which is found in the pine forests of the southern states, rarely exceed thirty inches in height: they are the most diminutive of the American oaks. The leaves are oval-acuminate, regularly but not deeply denticulated, of a light green above and whitish beneath. Its fructification is annual, and its flowers put forth in May, and are followed by acorns of a middling size, somewhat elongated, similarly rounded at both ends, inclosed for one-third of their length in scaly, sessile cups: they are very sweet. Nature seems to have sought a compensation for the diminutive size of this shrub in the abundance of its fruit: the stem, which is sometimes no bigger than a quill, is stretched at full length

upon the ground by the weight of the thickly clustering acorns.

*Q. PRINUS DISCOLOR, Swamp White Oak*. Except the state of Maine



and the maritime parts of the southern states, this oak is diffused throughout the Union: in comparison, however, with some other species, it is not common. It is a beautiful tree, more than seventy feet in height, of which the vegetation is vigorous and the foliage luxuriant. The leaves are six or eight inches long and four inches broad, smooth and of a dark green above, downy and lighter colored beneath; they are entire towards the base, which is cuneiform, but are widened and coarsely toothed for two-thirds of their length towards the summit. The tree is distinguished, when young, by the form of its base and by the down upon the leaves, which is more sensible to the touch than on any analogous species. At a riper age the lower side of the leaf is of a silvery white, which is strikingly contrasted with the bright

green of the upper surface; hence the specific name of *discolor*. This tree is of annual fructification, and flowers in the month of May. The acorns are sweet, but seldom abundant; they are rather large, of a brown complexion, and contained in a spreading cup edged by short, slender filaments, more downy within than those of any other oak, and supported by peduncles one or two inches in length.

The trunk of this tree is clad in a scaly, grayish-white bark. The wood is strong, elastic, and heavier than that of the white oak. In stocks more than a foot in diameter the grain is fine and close, and the pores are nearly obliterated. It splits easily and in a straight line, and is esteemed next in quality to the white oak, though, from its rareness, it is but accidentally employed in the arts.

*Q. PRINUS MONTICO'LA*, *Rock Chestnut Oak*. This oak, which grows only in particular situations, is found in the northern and middle states. It is sometimes three feet in diameter, and more than sixty feet high; but as its growth is usually repressed by the poverty of the soil, it rarely attains these dimensions. In open, elevated situations it spreads widely,

and forms a head like that of the apple tree. The beautiful appearance of this tree, when growing in a fertile soil, is owing equally to the symmetry of its form and to the luxuriance of its foliage. The leaves are five or six inches long and three or four broad, oval and uniformly denticulated, with the teeth more regular but less acute than those of the chestnut oak. When beginning to open in the spring, they are covered with a thick down; but when fully expanded they are perfectly smooth, whitish beneath, and of a delicate texture. The petiole is of a yellow color, which becomes lighter towards autumn. The fructification of this tree is annual. The flowers appear in the month of May, and are succeeded by brown acorns of an oblong-oval shape, and sometimes an inch in length, a third part of which is contained in a spreading cup covered with loose scales: they are sweet-tasted, and are a favorite nourishment of wild and domesticated animals.

When the trunk of this tree exceeds a foot in diameter, it is covered with a thick, hard, deeply furrowed bark, which is esteemed in some parts of the United States for tanning. That of the secondary

branches and of stocks less than six inches thick is commonly employed. The epidermis is strongly impregnated with the tanning principle, which in other species resides only in the cellular integument. The wood is reddish like that of the white oak, but its pores are more open, though its specific gravity is greater: pieces of both species being thrown into water, the white oak remains on the surface and the other at the bottom. At New York and on the banks of the Hudson, it holds the next place to the white oak in the construction of vessels. It is employed for the lower part of the frame, and oftener for the knees and the ribs. For fuel this wood is next in price to the hickory.

Q. PRINUS PALUSTRIS, *Chestnut White Oak, Swamp Chestnut Oak*. This is an oak of the middle, southern, and probably the western states. Under favorable circumstances it arrives at the height of ninety feet, with a proportional diameter. Its straight trunk, undivided and of a uniform size to the height of fifty feet, and its expansive, tufted summit, form one of the most beautiful and majestic trees of the North American forests. Its leaves are eight or nine inches long, four or five

inches broad, obovate, deeply toothed, of a light, shining green above and whitish beneath. Its fructification is annual. The flowers make their appearance in May, and are followed by brown, oval acorns, larger than those of any other species except the over-cup white oak, and are contained in shallow, scaly cups. Being sweet-flavored, and sometimes abundant, they are sought with avidity by wild and domesticated animals.

The wood, which is affected by the richness of the soil, is inferior to that of the post oak, the white oak, and even that of the over-cup oak; and its pores, though nearly obliterated, are more open. But it is superior to many other species, and is employed for wheelwrights' work and for other objects which require strength and durability. As it splits in a straight line, and may be divided into fine shreds, it is chosen by the negroes for baskets and brooms. Its pores are too open to contain wine or spirituous liquors. In the form of rails it lasts twelve or fifteen years, or a third longer than the willow oak. It is highly esteemed as fuel.

Q. PUMILA, *Running Oak*. This species is the smallest oak hitherto

discovered in the known world. Like the upland willow oak, it is confined to the maritime parts of the Carolinas, Georgia and the Floridas, where it is called *Running Oak*. It springs with that species in the pine-barrens, amidst the numerous varieties of whortleberry and other plants which overspread the ground wherever there is a little moisture in the soil and the layer of vegetable mould is a few inches thick.

The running oak rarely rises more than twenty inches in height and two lines in diameter. The leaves are of a reddish tint in the spring, and turn green as the season advances. When fully developed they are entire, smooth, of an elongated, oval shape, and about two inches in length. It fructifies once in two years, and flowers in the month of May. The acorns are small, round, and similar to those of the willow and water oaks; they are few in number, and seldom arrive at maturity. No particular use is made of this shrub either in the mechanic arts or for medicine.

Q. RUBRA, *Red Oak*. Next to the gray oak, this species is found in the highest latitude of all the American oaks, and is one of the most

common species in the northern states and Canada. It is a tall, wide-spreading tree, frequently more



than eighty feet high, and three or four feet in diameter. The leaves are smooth and shining on both sides, large and deeply lacinated, and rounded at the base; they are larger and have deeper and narrower sections on the young stocks than on the middle or the summit of the full-grown tree; these last resemble the leaves of the Spanish oak, which, however, are always downy beneath, while those of the red oak are perfectly smooth. In autumn they change to a dull red, and turn yellow before they fall. The fructification is biennial, and it flowers in May. The acorns are very large and abundant, rounded at the summit, compressed at the base, and contained in flat cups covered with narrow, compact scales. They are

voraciously eaten by wild and domesticated animals.

The bark of this tree consists of a very thin epidermis with a thick cellular integument. It is extensively used in tanning, but is less esteemed than that of the Spanish, black and rock chesnut oaks. The wood is reddish and coarse-grained, and the pores are often large enough for the passage of a hair: it is strong, but not durable, and is the last among the oaks to be employed in building. Its principal use is for staves, which, at home, are used to contain salt provisions, flour, and other dry wares. It is little esteemed for fuel.

**Q. TINCTORIA, Black or Quercitron Oak, Yellow Oak.** Except the state of Maine, the northern part of New Hampshire, Vermont and Tennessee, this species is found throughout the United States on both sides of the Alleghanies, and is everywhere called *Black Oak*, except in some parts of New England, where it is called *Yellow Oak*. This oak is one of the loftiest trees of the American forests, being eighty or ninety feet high and four or five feet in diameter. The trunk is covered with a deeply furrowed bark, of middling thickness, and generally of a black

or very deep brown color, whence probably is derived the name of *Black Oak*. The leaves are large,



deeply lacinated, and divided into four or five lobes: they resemble those of the scarlet oak, but have less deep and open sinuses, are less shining, of a duller green, and in the spring and during a part of the summer have their surfaces roughened with small glands, which are sensible to the eye and to the touch. The same appearance is observed on the young shoots, the leaves of which change in autumn to a dull red, and those of the old trees to yellow, beginning with the petiole. This tree fructifies once in two years, and its flowers put forth in May. The acorns generally grow in clusters, are of a brown color,



sub-sessile, and about half buried in a thick, scaly cup. This species is more remarkable than any other for producing the oak apple.

The wood is reddish and coarse-grained, with empty pores; it is, however, more esteemed for strength and durability than that of any other oak of biennial fructification. As it is abundant in the middle and northern states, it furnishes a large part of the *red oak staves* exported to the West Indies, or employed at home to contain flour, salted provisions and molasses. It is said to furnish the best of fuel except the hickories. The bark is extensively used in tanning, as it is easily procured and is rich in tannin. The only inconvenience which attends it is imparting a yellow color to the leather, which must be discharged by a particular process, to prevent its staining the stockings: it is a great error to assert that this color augments its value. From the cellular integument of the black oak is obtained the *quercitron*, of which great use is made in dyeing wool, silk and paper hangings. This substance was first prepared as a dye by Dr. Bancroft; he has given it the name of *quercitron*, by which it is now universally recognised.

*Q. VIRENS, Live Oak.* This species, which is confined to the maritime parts of the southern states, the Floridas and Louisiana, is known only by the name of *Live Oak*. It is commonly forty or fifty feet in height, and from one to two feet in diameter; but it is sometimes much larger. Like most other trees, it has, when insulated, a wide and tufted summit. Its trunk is sometimes undivided for eighteen or twenty feet, but often ramifies at half this height, and at a distance it has the appearance of an old apple tree or pear tree. The leaves are oval, coriaceous, of a dark green above and whitish beneath: they persist during several years, and are partially renewed every spring. On trees reared upon plantations, or growing in cool soils, they are one half larger, and are often denticulated: upon stocks of two or three years they are commonly very distinctly toothed. It fructifies once in two years. The flowers make their appearance in the month of May, which are succeeded by acorns of a lengthened, oval form, nearly black, and contained in shallow, grayish, pedunculated cups.

The bark upon the trunk of this

tree is blackish, hard and thick. The wood is heavy, compact, fine-grained, and of a yellowish color, which deepens as the tree advances in age. The number and closeness of the concentric circles evince the slowness of its growth. As it is very strong, and incomparably more durable than the best white oak, it is highly esteemed in ship-building, and is consumed not only in the country which produces it, but still more extensively in the northern states. From its great durability when perfectly seasoned, it is almost exclusively employed for the upper part of the frames of vessels. To compensate its excessive weight, it is joined with the red cedar, which is extremely light and equally lasting. This tree does not afford large timber; but its wide and branching summit makes amends for this disadvantage by furnishing a great number of knees, of which there is never a sufficient quantity in the dock-yards. This wood is said to make the best of trunnels. It is also employed for the naves and felloes of heavy wheels, for which it is superior to the white oak: it is more proper, also, for

screws and for the cogs of mill-wheels. The bark is excellent for tanning, but is only accidentally employed, and its wood is highly esteemed for fuel.

The oak is a genus of trees which affords some of its species in all the countries of the temperate zones of both hemispheres; and for its timber, fuel, bark, or fruit, is one of the most important. The timber furnished by the white oak for a variety of purposes, and by the live oak for ship-building, could not be replaced by that of any other trees in the United States. The bark of many species is the best for tanning leather that can be procured; and for beauty, and a clean, healthy aspect, as an ornamental or shade tree, the scarlet oak is equal, if not superior, to any exotic that has been introduced. In the great forests of the west, their acorns furnish food for thousands of swine, innumerable droves of wild turkeys, &c. The *Cork Tree*, *Q. SUBER*, also belongs to this genus, producing acorns like the rest of the family. It is cultivated in Spain, Portugal, and the south of France, and furnishes the common cork of commerce.

## R.

**RANUNCULUS.** Crowfoot. 13  
 —4. Calyx inferior, of five egg-shaped, deciduous leaves; petals five, roundish, shining; nectary a pore at the base of each petal, generally covered by a scale; filaments numerous, thread-like, much shorter than the petals; anthers linear, or heart-shaped, erect, two-celled; germens numerous, collected into a round head; styles none; stigmas small; seeds numerous, egg-shaped, tipped with a point or hook.

**R. FLAMMULA,** *Small Spearwort*: leaves between lance-shaped and linear, with a thickened tip, nearly entire, stalked; stem decumbent at the base; root fibrous; seeds smooth; stem from six to eighteen inches long, sometimes entirely decumbent, slightly branched, leafy; leaves alternate, the lower ones sometimes broad; petals gold-yellow; nectaries minute. This plant is extremely acrid, and is used in the Hebrides for raising blisters. Dr. Withering recommends the distilled water as an instantaneous emetic in cases of poisoning. Flowers small; solitary, yellow; June to August; perennial; grows in wet places.

**R. AURICOMUS,** *Goldilocks, Wood Crowfoot*: root-leaves kidney-shaped, crenate, three-cleft; stem-leaves fingered, with linear segments; stem many-flowered; calyx colored; root fibrous; stem about a foot high, erect, branched; leaves more or less downy; flowers terminal; solitary, gold-yellow; calyx pale yellow, hairy; nectary a naked pore. Perennial; flowers in April and May; grows in woods and bushy places.

**R. LINGUA,** *Greater Spearwort*: leaves lance-shaped, pointed, nearly sessile, somewhat serrate; stem erect, many-flowered; root fibrous; seeds smooth; stem about three feet high, with close-pressed hairs; calyx hairy; petals bright yellow; nectary covered by a small scale. Perennial; flowers in July and August; grows in ditches and at the edges of lakes and pools; not common.

**R. SCCLERA'TUS,** *Celery-leaved Crowfoot*: stem erect, hollow, much branched; leaves smooth, lower ones palmate, upper fingered; fruit oblong; seeds very numerous, minute; root fibrous; stem from six inches to two feet high, smooth, round, leafy; lower leaves stalked, upper sessile, uppermost undivided;

flowers small, pale yellow, numerous; calyx hairy, reflected; nectary somewhat tubular. This species is extremely acrid, and blisters the skin. Annual; flowers from June to September; grows in watery places.

*R. bulbosus*, *Bulbous Crowfoot*, *Butter-cups*: calyx reflected; flow-



er-stalks furrowed; stem erect, many-flowered; leaves compound; root bulbous; seeds smooth; root a solid round bulb; stem about a foot high, hairy; lower leaves compound, their leaflets cut or lobed; flowers terminal, solitary; calyx-leaves egg-shaped, hairy; petals gold-yellow; nectary covered by a scale. Perennial; flowers in May; grows in pastures and meadows; very common.

*R. hirsutus*, *Pale Hairy Crowfoot*: calyx reflected, pointed; stem erect, many-flowered, hairy; leaves

ternate; root fibrous; seeds tuberculated; stem from three inches to



a foot high; flower-stalks furrowed, hairy; calyx hairy, reflected; petals gold-yellow; nectary covered by a scale. Annual; flowers from June to October; grows in moist meadows and waste ground; common.

*R. repens*, *Creeping Crowfoot*: calyx spreading; flower-stalks furrowed; runners creeping; leaves compound, erect, the uppermost entire; stem erect or ascending, about a foot high, hairy; leaves twice ternate; flowers gold-yellow; nectary covered by a notched scale. Perennial; flowers in the summer months; grows in rich soil, by walls, and in shady places; common.

*R. acris*, *Upright Meadow Crowfoot*: calyx spreading; flower-stalks round; leaves tripartite, their segments three-cleft and out, those of the uppermost linear and entire; stem erect, two feet high, covered

with close-pressed hairs, many-flowered; calyx hairy; petals bright yellow; nectary covered by a scale. Perennial; flowers in June and July; grows in meadows and pastures; common.

*R. HEDERA'CEUS, Ivy-leaved Crowfoot*: stem creeping; leaves smooth, roundish or kidney-shaped, with three or five rounded entire lobes; petals small; stamens from five to ten; stem creeping or floating; leaves stalked, dark green. Perennial; flowers from May to August; grows in ditches and muddy places.

*R. AQUA'TILIS, Water Crowfoot*: immersed leaves in fine hair-like segments; floating leaves three-lobed, bluntly crenate; stems submerged, branched; flowers on long stalks, rising a little out of the water; petals white, yellow at the base. Perennial; flowers in May and June; grows in ditches, ponds, and rivers.

*RAPH'ANUS, Radish, 15.* Calyx of four oblong, parallel, erect, deciduous leaves, two of them slightly prominent at the base; petals inversely egg-shaped or heart-shaped, spreading, with linear, erect claws; filaments awl-shaped, erect, a gland within each of the shorter, and one at the outside of each pair

of the longer; anthers oblong; germen cylindrical, tapering; style awl-shaped; stigma knobbed, small; pod oblong, tapering upward, irregularly tumid, as if jointed, leathery, with two incomplete cells; seeds globular, arranged in a single row.

*R. RAPHANISTRUM, Wild Radish*: pods one-celled, jointed, striated; leaves lyre-shaped; the whole plant rough with bristles; stem from one to two feet high; flowers pale yellow. Annual; flowers in the summer months; grows in fields and waste places.

*R. SATIVUS* is the well-known radish of the gardens.

*RHINANTHUS, Yellow Rattle, 14—2.* Calyx of one leaf, roundish, inflated, compressed, with four nearly equal, acute, marginal teeth; corolla gaping; tube nearly cylindrical, as long as the calyx; upper lip narrower, helmet-shaped, compressed, slightly cleft; lower lip broader, expanded, deeply divided into three obtuse segments, the middle one somewhat larger; filaments thread-shaped, shorter than the upper lip, and concealed by it; anthers two-lobed, hairy; germen egg-shaped, compressed, with a channel at each side; style thread-shaped, curved, a little long-

er than the stamens; stigma obtuse, bent inwards; capsule roundish, compressed, with a small point, two-celled, two-valved; partitions transverse, united; seeds compressed, imbricated, bordered.

**R. CRISTA-GAL'LI**, *Yellow Rattle*: stem branched; leaves lance-shaped, serrate; calyx smooth; seeds with a dilated membranous border;



stem about a foot high, generally with few branches, sometimes bushy; leaves rough, wrinkled; flowers axillar, crowded into a leafy spike; calyx membranous; corolla yellow; the ripe seeds rattle in the capsule; annual; flowers in July; grows in pastures; common.

**RHODODENDRON**. 10—1.

**R. MAXIMUM**, *Dwarf Rose Bay*: leaves oblong, glabrous, discolored beneath; umbels terminal; corolla rotate; petals roundish. This splendid-flowering shrub is common in the mountainous regions of the mid-

dle and southern states, and is sometimes, but rarely, met with in Massachusetts. It sometimes attains the height of twenty or twenty-five feet, with a diameter of four or five inches. When the leaves are beginning to unfold themselves they are rose-colored, and covered with red down; when fully expanded they are smooth, five or six inches long, of an elongated-oval form, and of a thick, coriaceous texture. They are ever-green, and are partially renewed once in three or four years. It puts forth flowers in the month of June and July, which are commonly rose-colored, with yellow dots on the inside, and sometimes they are perfectly white. They are always collected at the extremity of the branches in beautiful groups, which derive additional lustre from the foliage which surrounds them. The seeds are extremely minute, and are contained in capsules that open in autumn for their escape. The wood is hard, compact and fine-grained; but it is inferior in these respects to that of the mountain laurel. It is appropriated to no particular use in the arts.

**RHUS**. *Sumach*. 5—3.

**R. GLABRA**, *Smooth Sumach*: leaflets lanceolate, acuminate, with

close serratures, smooth on both sides, whitish beneath; flowers dioecious, in dense terminal clusters, succeeded by crimson-colored berries, which in autumn become covered with a whitish or rose-colored, extremely acid substance; flowers in June, July; height about eight feet; common about the borders of fields and pastures; lands neglected for a few years will sometimes be entirely overrun with it.

R. TYPHINA, *Stag's-horn Sumack*, *Velvet Sumack*: leaflets lanceolate, acuminate, finely serrated, hairy beneath. A larger species than the last, with similar flowers and fruit. It reaches the height of twenty feet. Flowers in June; grows in low grounds.

The leaves and young shoots of these shrubs are used for tanning morocco leather. A red dye is obtained from the berries of R. glabra.

R. VER'NIX, *Poison Dogwood*, *Poison Sumack*, *Poison Elder*: leaflets entire, annual, acuminate, smooth; leaf-stalks entire, equal; panicle diffuse; flowers dioecious. This is a handsome shrub of our swamps, reaching about fifteen feet, with an open or diffuse top, the branches growing out in a horizontal direction. It may be readily known by

the leaf-stalks, which are always very smooth and shining, and gene-



rally of a fine red or purple color. Not only the whole plant, but the effluvia arising from it, is very poisonous to some constitutions, producing inflammation. The Japan varnish is made from this species.

RHYNCHOSPORA. 3—1. Calyx a chaff-scale; corolla none, excepting a few bristles; spikes of few flowers, together with numerous, empty, crowded chaff-scales, imbricated all round; filaments hair-like; anthers linear, erect; germen superior, roundish; style hair-like, enlarged at the base; seed roundish, hard, crowned by the permanent base of the style.

R. AL'BA, *White-headed Beak-rush*: leaves tapering, linear, channelled; spikes forming a somewhat corymbose head; stamens two; straw from five to ten inches high, triangular, very slender; leaves

erect; larger floral leaf a little longer than the head of flowers, which is white; stigmas two; seed inversely egg-shaped; perennial; flowers in July and August; grows in wet, boggy places.

*R. RUBRA*, *Brown-headed Bear-rush*: leaves thread-shaped; spikes forming an egg-shaped head; three stamens; smaller than the last; leaves not tapering; head of flowers reddish brown; perennial; flowers in June; grows in swamps.

**RIBES.** Currant. 5—1. Calyx superior, of one leaf, tumid, permanent, with five oblong, spreading, marginal segments; petals five, small, obtuse, erect, from the edge of the calyx; filaments awl-shaped, short, erect, arising from the calyx; anthers compressed, two-lobed; germen roundish; style cleft; stigma obtuse; berry globular, dimpled, one-celled, with two lateral, longitudinal receptacles; seeds numerous, roundish, somewhat compressed.

*R. TRIFLOIDUM*, *Wild Gooseberry*: prickles solitary; leaves smooth, three or five-lobed, cut-toothed; peduncles two or three-flowered; pedicels elongated; petals spatulate, undulate; style rough with soft hairs, semi-two or three-fid, exserted; berries smooth, pale red. A bushy shrub, three or four feet high, with

fruit resembling the common gooseberry. Flowers green; May; grows in woods.

*R. ALEXA*, *Mountain Currant*: branches upright; leaves smooth above, the veins hairy beneath, lobes and teeth acute; racemes loosely many-flowered, stiffly upright; berry rough, hairy, red; flowers green; June. A handsome shrub, growing on our northern mountains.

*R. CYNOSBATI*, *Swamp Gooseberry*: prickles sub-axillary; berries



prickly, racemose, dull brown; flowers green; June. A handsome species of some of the northern mountains, about four feet high.

*R. FLORIDUM*, *Large-flowering Currant*: leaves dotted on each side; racemes pendulous; flowers cylindrical; bracteas longer than the germen; flowers green; May. A handsome shrub, with black, insipid fruit, three or four feet high, growing in woods.

*R. LACUS'TRE*, *Swamp Gooseberry*: spine sub-axillary, compound; stem rough all over with stiff hairs;



leaves lobed beyond the middle; berries racemose, rough with long prickles; flowers small, yellow; June. A handsome shrub of our northern woods, about four feet high.

*R. RUBRUM*, with a white variety, is the common currant of the gardens. *R. NIGRUM*, the *Black Currant*, is also cultivated. *R. AUREUM*, *Golden Currant*, a beautiful species with yellow flowers, has been introduced into our gardens as an ornamental shrub. Its height is about eight feet. It is a native of Missouri, and is sometimes called *Missouri Currant*.

**ROBINIA. Locust Tree. 17—4.**

*R. PSEUDACACIA*, *Locust*: racemes with one-flowered pedicels; leaves



pinnated, with from eight to twelve pairs of leaflets and a terminal one; pods smooth. From the excellent properties of its wood, and the beauty of its foliage and flowers, the locust ranks in the first class of the trees of the American forests. In

the Atlantic states it begins to grow naturally in Pennsylvania, between Lancaster and Harrisburgh, in the latitude of forty degrees twenty minutes. West of the mountains it is found two or three degrees farther north. In favorable situations it sometimes exceeds four feet in diameter and seventy or eighty feet in height, which is twice the size it attains east of the mountains. On the trunk and large limbs of the old locust, the bark is very thick and deeply furrowed. The young tree, till it attains the diameter of two or three inches, is armed with formidable thorns, which disappear in its mature age. The foliage is light and agreeable to the eye. Each leaf is composed of opposite leaflets, eight, ten, or twelve, and sometimes more, in number, surmounted by an odd one. The leaflets are nearly sessile, oval, thin, of a fine texture, and of so smooth a surface that the dust is blown off from them as it alights. These leaves are rarely injured by insects. The flowers, which open in the month of May, are disposed in numerous, pendulous bunches: they are perfectly white, and diffuse the most delicious odor. Their fine effect, heightened by the fresh tint of the light green foliage,

renders this tree one of the most admired in Europe among the ornamental trees. To the flower succeeds a narrow, flat pod, about three inches long, containing five or six small seeds, which are commonly brown, and sometimes black.

The wood of the locust, which is commonly of a greenish-yellow color, marked with brown veins, is very hard, compact, and susceptible of a brilliant polish; it is possessed of great strength with but little elasticity. Its most valuable property is that of the power of resisting decay longer than almost any other species of wood. In naval architecture the shipwrights use as much locust wood as they can procure. It is as durable as the live oak and the red cedar, with the advantage of being stronger than the one and lighter than the other. It enters, with the live oak, the white oak and the red cedar, into the upper and lower parts of the frame, though in a very small proportion. It is also used for the *trunnels*, or the pins destined to attach the side-planks to the frame. Instead of decaying, they acquire with time an extreme hardness, and they are used, to the exclusion of all others, in the ports of the middle and

northern states. In the construction of houses, even of such as are wholly of wood, the locust is not extensively employed in those parts of the country where it is most multiplied: the use to which it is more particularly applied is to support the *sills*, or the beams on which the frame rests. These sills are of oak, and if they were placed immediately on the ground, they would decay more rapidly than the locust. From the hardness of the wood when seasoned, from the fineness of its grain, and its lustre when polished, it has been extensively substituted by turners for the box wood in many species of light work, such as small domestic wares, toys, &c. It is highly esteemed for posts of fence and for fuel. This invaluable property of durability, which is possessed by this tree in a great degree, far superior to that of any other except the red mulberry, sufficiently indicates the purposes to which it may be advantageously applied; but its use is limited to the objects which we have enumerated.

There are said to be several varieties of locust growing in the United States; those trees are reputed the best whose heart is red; the next in esteem are those with a greenish-

yellow heart ; and the least valuable are those with a white heart. From this variety in the color of the wood, which probably arises from a difference of soil, are derived the names of *Red*, *Green*, and *White Locust*. In the western states there is a variety which is sometimes called *Black Locust*.

*R. VISCOSA*, *Rose-flowering Locust* : racemes with one-flowered pedicels ; leaves pinnate, with a terminal, odd leaflet ; branches and pods viscid with glands. This locust is common only in the southern states east of the Alleghanies. It is not so large as the preceding species ; its ordinary stature does not exceed forty feet, with a diameter of ten or twelve inches. Its branches, like those of the locust, are garnished with thorns, which, however, are smaller and less numerous. The annual shoots are of a dull red color, and are covered with a viscid, adhesive humor. The foliage is thick, and of a dusky green. The leaves are five or six inches long, and are composed of opposite leaflets, ten, twelve or more in number, with a terminal odd one. The leaflets are about an inch in length, oval, nearly sessile, smooth, and of a fine texture. The flowers are in

open bunches, four or five inches long. They are numerous and of a beautiful rose-color, but destitute of fragrance. This tree not unfrequently blooms twice in a year, and it would form one of the most brilliant ornaments of the park and of the garden. The seeds are small, and contained in hairy pods two or three inches long and three or four lines broad.

The wood of this tree is of a greenish color, like that of the common species, which it resembles also in its other properties : but the inferior size of the tree, notwithstanding its surprisingly rapid growth, renders it less interesting to the arts.

*ROSA*. Rose. 12—3. Calyx of one leaf, inferior, with a pitcher-shaped tube, contracted at the summit, permanent, and finally succulent, the limb deeply divided into five deep, lance-shaped, pointed segments, either all simple, or two of them with leafy appendages on both sides, one with appendages on one side only, and the other two naked on both sides ; petals five, inversely heart-shaped ; filaments thread-like, numerous, much shorter than the petals ; anthers roundish, flattened, two-lobed ; germens numerous, oblong, lining the tube of the calyx,

interspersed with silky hairs; styles one to each germen, lateral; stigmas obtuse; fruit globular or egg-shaped, formed of the permanent, pulpy, colored tube of the calyx, closed at the top; seeds numerous, bristly, lining the calyx, and interspersed with hairs.

*R. RUMICINOSA*, *Eglantine*, *Sweet-brier*: fruit inversely egg-shaped, bristly towards the base; calyx pinnate; prickles hooked, compressed, with smaller straighter ones interspersed; leaflets elliptical, doubly serrate, hairy, covered beneath with rust-colored glands; stem bushy, about four feet high; prickles scattered, hooked, conical, interspersed with others of a smaller size; stipules narrow lance-shaped, closely fringed with glands, as are the leaflets; petals bright pink; fruit scarlet; flowers in June and July; grows in dry bushy places. As interesting a species as can be found in field or garden. The odor of the leaves, when bruised or rubbed, is peculiar, and very grateful.

There are several other species of wild rose, the most interesting ornaments of our woods, swamps and pastures. No plant has been so highly and universally esteemed as the rose. Cultivation has multiplied

the species into endless varieties, and there is scarce a garden without some of them. One garden, in France, is said to contain nine hundred different kinds.

*RUBUS*. Bramble. 12—3. Calyx inferior, of one leaf, with five oblong, spreading, permanent segments; petals five, round, as long as the calyx; filaments hair-like, shorter than the petals; anthers roundish, flattened, two-lobed; germens numerous, globular, crowded closely together into a round head; styles one to each germen, small, hair-like, lateral; stigmas simple, permanent; berry compound, globular, concave, deciduous, of several round, juicy grains, upon a conical, spongy receptacle; seeds solitary, oblong.

*R. OCCIDENTALIS*, *Thimble-berry*, *Black Raspberry*: leaves trifoliate, white beneath; stem prickly; petioles round; flowers white; May, June; perennial; fruit regular, black, of an agreeable taste; height four or five feet; common in thickets and about fences.

*R. STRIOSUS*, *Red Raspberry*: unarmed, hispid; leaflets three, or pinnate-quinate, ovate, blunt at base, white beneath; odd leaf cordate; flowers white, clustering, ter-

animal; berries red, of a rich, delicate, peculiar flavor; flowers in May; perennial; grows in thickets and by fences, sometimes covering acres of recently cleared woodlands.

**R. VILLO'SUS**, *Tall Blackberry*, *Hgh Blackberry*: leaves trifoliate or quinately, finely serrate, villous on each side; stem and petioles prickly; racemes erect; flowers white; June; perennial; fruit abundant, long, shining, very sweet; grows in thickets and by road-sides. Figured in Bigelow's Medical Botany.

**R. TRIVIALIS**, *Low Blackberry*: procumbent, prickly; stipules subulate; leaves three to five-digitate; leaflets ovate, oblong, smoothish, serrate; pedicels solitary; flowers white, solitary; May; fruit large, black, shining, somewhat irregular, very sweet; common in dry, neglected pastures.

These are the most interesting species of this large family of plants. They are a prickly, clothes-tearing race; but as their fruit is delicious, like the fox in the fable, we can tolerate their bad qualities on account of their good ones.

**RUMEX**. Dock: 6—3. Calyx inferior, of three obtuse, permanent leaves; petals three, larger than the calyx, and similar in color,

but thinner and more veiny, permanent, ultimately enlarged and converging round the seed; filaments thread-shaped, very short; anthers erect, oblong, two-lobed; germen superior, triangular; styles thread-shaped, spreading, standing out between the petals; stigma large, in many tufted segments; seed single, triangular, polished.

**R. SANGUINEUS**, *Bloody-veined Dock*: enlarged petals entire, oblong, one at least bearing a tubercle; leaves lance-shaped, somewhat heart-shaped; stem two or three feet high, erect, branched, leafy, reddish; leaves all stalked, slightly curled at the edges. Perennial; flowers in July; grows in woods and waste places.

**R. CRISPUS**, *Curled Dock*: enlarged petals entire, egg-shaped, all bearing a tubercle; leaves lance-shaped, wavy, acute; stem two or three feet high, erect, panicled, leafy; clusters of numerous tufts or whorls, of drooping flowers; a very troublesome weed. Perennial; flowers in July; grows in pastures, waste places, &c.; common.

**R. ACUTUS**, *Sharp-leaved Dock*: enlarged petals oblong, abacutely toothed, all bearing a tubercle; leaves between oblong and heart-

shaped, pointed; clusters leafy; stem about two feet high, angular, furrowed, leafy, alternately branched; leaves stalked; branches loose, bearing numerous distant whorls of flowers. Perennial; flowers in July; grows in watery places.

R. OBTUSIFOLIUS, *Broad-leaved Dock*: enlarged petals toothed, one principally bearing a tubercle; root-leaves heart-shaped, obtuse; stem roughish; stems about three feet high, erect, branched, furrowed, leafy; root-leaves very large, the others more narrow, all notched and curled more or less at the edge; a troublesome weed. Perennial; flowers in July and August; grows about houses, in waste places and fields.

R. ACETOSEL'LA, *Sheep's Sorrel*: enlarged petals destitute of tubercles; leaves halbert-shaped; stem from four inches to a foot high, erect, leafy; the whole plant is powerfully acid, but less juicy than the preceding. Perennial; flowers in the summer months; grows in pastures, cultivated fields, and waste places; common.

RUPPIA. 4—3. Calyx none; corolla none; anthers four, sessile, equal, roundish; germens four, egg-shaped, close together; styles none;

stigmas obtuse; seeds four, egg-shaped, obliquely pointed, each elevated on a long stalk.

R. MARI'TIMA, *Sea Ruppia*, *Sea Tassel-grass*: the only species. The whole plant submersed; roots fibrous, tufted; stem long, slender, round, much branched, leafy; leaves linear, alternate; spikes two-flowered, on short axillar stalks. Perennial; flowers in August and September; grows in salt water, ditches and pools.

## S.

SAGITTARIA. *Arrow-Head*. 21—7. Barren flowers numerous: calyx of three egg-shaped, permanent leaves; corolla of three roundish, spreading, deciduous petals, thrice the size of the calyx; filaments numerous, about twenty-four, awl-shaped, collected into a round head; anthers heart-shaped, much shorter than the petals.

Fertile flowers fewer, below the others: calyx and corolla as above; germens numerous, collected into a head, compressed, bulging externally, tapering into very short styles; stigmas acute, permanent; seeds numerous, inversely egg-shaped, compressed, margined.

*S. SASITIFOLIA*, *Common Arrow-Head*: leaves arrow-shaped, acute; leaves all from the root, on long cel-



lular stalks; flowers white, three in a whorl; perennial; flowers in July; grows in ditches and at the edges of pools and rivers.

*SALICORNIA*. Glasswort. 1  
—1. Calyx inferior, of one leaf, undivided, tumid, permanent; corolla none; filament one or two, longer than the calyx; anther oblong, two-lobed, erect; germen egg-shaped, under the stamen; style short, undivided; stigma cleft; seed egg-shaped, invested by the calyx.

*S. HERBA'CEA*, *Common Jointed Glasswort* or *Saltwort*, *Marsh Samphire*: stem herbaceous, erect; joints compressed, notched, their intervals somewhat enlarged upwards; spikes tapering upwards; one foot high; stem bushy, green, the branches nearly cylindrical; spikes

of numerous short joints, each bearing three sessile flowers on two opposite sides; annual; flowers in August and September; grows on muddy or moist sandy sea-shores; frequent; has a saltish taste, is eaten by cattle, and makes a good pickle. The various species of this genus are employed on the coasts of the Mediterranean for making barilla.

*SALIX*. Willow. 22—2. Barren flowers: catkin oblong, imbricated all round; calyx an oblong, spreading, one-flowered scale; corolla none; nectary a small, oblong, compressed gland, at the base of the scale, sometimes double; filaments generally two, but varying from one to five or more, thread-shaped, longer than the calyx; anthers two-lobed, two or four-celled.

*S. ERIOCEPH'ALA*, *Swamp Willow*: dianchous; twigs downy; leaves oblong-oval, somewhat retuse at the base, serrulate; aments oval, very villous. A small tree, very common in meadows and low grounds by the side of brooks. The catkins are among the first to show themselves in the early spring. They are immediately followed by the bright green, silky leaves, and the tree wears quite a gay appearance.

*S. VITELLINA*, *Yellow Willow*, *Golden Osier*: leaves lance-shaped, acute, with cartilaginous serratures,



smooth above, glaucous and somewhat silky beneath; stipules minute, lance-shaped, deciduous, smooth; germen sessile, broadly lance-shaped, smooth; scales between lance-shaped and linear, acute, fringed at the base, longer than the pistil; a tree of moderate height, with smooth, shining, yellow branches; flowers in May; introduced, but common.

*S. VIMINALIS*, *Osier*, *Basket Wil-*



*low*: leaves linear, inclining to

lance-shaped, elongated, taper-pointed, entire, waved, snow-white and silky beneath; branches straight and slender; germen sessile; style as long as the linear, undivided stigmas; a tree, with very long, straight branches, downy when young; cultivated in Europe for basket-work of various kinds: flowers in May; grows in wet meadows, and by rivers; common.

*S. RETICULATA*, *Wrinkled-leaved Willow*: leaves broadly elliptical, nearly circular, obtuse, entire, leathery, with reticulated veins, nearly smooth, glaucous beneath; germen sessile, downy; a small shrub, with stems two or three inches high, readily distinguished by its curiously reticulated leaves; flowers in June.

*S. PETIOLARIA*, *Dark-long-leaved Willow*: leaves lance-shaped, serrate, smooth, glaucous beneath, somewhat unequal at the base; stipules lance-shaped, somewhat curved, toothed; catkins loose; scales hairy, shorter than the stalks of the egg-shaped, silky germens; stigmas divided, sessile, a bushy tree, with slender purplish branches; leaves four inches long, bright green above; flowers in April.

*S. DECIPENS*, *White Welsh* or



**Varnished Willow** : leaves lance-shaped, pointed, serrate, very smooth ; flower-stalks somewhat glandular ; germen tapering, stalked, smooth ; style longer than the cleft stigmas ; branches highly polished ; a small tree, distinguished by its shining clay-colored branches. When cultivated, it affords good rods for basket-work ; flowers in May.

**S. RUSSELLIA'NA, Bedford Willow** : leaves lance-shaped, tapering at both ends, serrate, very smooth ; leaf-stalks glandular, sometimes bearing leaflets ; germen tapering, stalked, longer than the scales ; style as long as the stigmas ; a tall and handsome tree, with long light green leaves ; flowers in April and May ; grows by rivers and in marshy woods and meadows.

**S. LAMBERTIA'NA, Boyton Willow** : branches erect ; leaves lance-shaped, broadest towards the end, pointed, serrate, smooth, rounded at the base ; stipules none ; stamen one ; stigmas egg-shaped, obtuse, notched, very short, nearly sessile ; a small tree, with erect, purplish branches ; flowers in April ; grows on the banks of rivers.

**S. MYRSIN'ITES, Green Whortle-leaved Willow** : leaves elliptical,

serrate, smooth, veiny, polished on both sides ; young branches hairy ; germen stalked, downy ; capsules awl-shaped ; a small bushy shrub, with dark brown branches ; flowers in May and June.

**S. HERBA'CEA, Least Willow** : leaves round, serrate, reticulated with veins, smooth and shining on both sides ; germen stalked, egg-shaped, smooth ; a diminutive shrub, scarcely two inches above ground, with long branched roots ; flowers in June.

**S. RE'PENS, Common Dwarf Willow** : leaves between elliptical and lance-shaped, straight, somewhat pointed, nearly entire, almost naked above, glaucous and silky beneath ; stipules none ; stem depressed, with short, erect branches ; germen stalked, egg-shaped, downy ; capsules smooth ; a small shrub, with a prostrate stem, and numerous erect branches ; flowers in May.

**S. ROSMARINIFO'LIA, Rosemary-leaved Willow** : leaves between linear and lance-shaped, pointed, straight, entire, silky beneath ; stem erect ; catkins egg-shaped, recurved ; germen stalked, lance-shaped, silky ; a slender shrub, two or three feet high, with erect, very slender branches, silky when young ; flow-

ers in April; grows in moist sandy ground.

*S. AL'BA*, *Common White Willow*: leaves between elliptical and lance-shaped, pointed, serrate, silky on both sides, the lowest serratures glandular; stamens hairy; germen smooth, almost sessile; stigmas deeply cleft; scales rounded; a tall tree, with rugged bark and spreading branches, silky when young. Flowers in May; grows in moist woods, and on the banks of rivers and ditches.

The *Weeping Willow*, so much esteemed as an ornamental tree, is *S. babylonica*. It was originally from Persia.

*SAMBU'CUS*. Elder. 5—3. Calyx superior, of one leaf, small, deeply divided into five segments, permanent; corolla of one petal, nearly wheel-shaped, but concave, with five obtuse segments; filaments awl-shaped, as long as the corolla; anthers roundish; germen egg-shaped, obtuse; style none; stigmas three, obtuse; berry globular, one-celled; seeds three, convex externally, angular on the inner side.

*S. CANADENSIS*, *Common Elder*: cymes with five principal branches; stipules obsolete; leaflets egg-shap-

ed; stem woody; a small shrub with smooth branches, filled with



light spongy pith; cymes large, of numerous cream-colored flowers; berries globular, purplish black; the inner green bark is purgative and diuretic, as are the leaves. The berries are gently laxative; they are also used for making a kind of wine, as well as for adulterating Port. Flowers in July; common by fences and road-sides.

*SAMOLUS*. Brook-weed. 5—1. Calyx inferior, of one leaf; tube hemispherical; margin deeply divided into five equal, permanent segments; corolla of one petal, funnel-shaped; tube wide, as long as the calyx; limb with five deep, obtuse segments, and five small intermediate scales at the base; filaments awl-shaped, short, arising from the middle of the tube; anthers roundish, two-lobed, covered by the scales of the corolla; germen nearly globular, covered by the tube of the corolla; style erect, short; stigma

knobbed; capsule globular, one-celled, its lower half closely invested by the calyx; seeds numerous, small, angular, covering the globular, central receptacles.

**S. VALERANDI**, *Water Pimpernel*: leaves inversely egg-shaped, obtuse; clusters many-flowered; partial flower-stalks each with a small bractea; smooth, pale green; stem erect, round, about a foot high; flowers small, white; perennial; flowers in July; grows in watery places, on gravelly soil.

**SANGUINARIA**. Puccoon. 13—1.

**S. CANADENSIS**, *Blood Root*: leaves solitary, radical, kidney-shap-



ed; scape naked, one-flowered, sheathed at the base; petals varying in number, generally eight, spreading. The only species. Flowers white; April; perennial; height six inches. A singular and

interesting plant of our woods and thickets. Every part, when bruised, discharges a blood-colored fluid, with which the Indians are said to have stained their skins. It has a tuberous, fleshy root, with red fibres and a reddish juice; from each bud of the root there springs a single fig-like, glaucous leaf, with a one-flowered scape. One of our earliest spring flowers.

**SANGUISORBA**. Burnet. 4—1. Calyx superior, of one leaf, deeply four-cleft, the segments egg-shaped, colored; corolla none; filaments dilated upwards, as long as the calyx; anthers roundish, two-celled; germen inferior, four-cornered; style thread-shaped, short; stigma notched; capsule four-cornered, one-celled, not bursting; seeds one or two, elliptical.

**S. CANADENSIS**, *Canada Burnet*: spikes cylindrical, very long; stamens much longer than the corolla; stem smooth, erect, herbaceous, two or three feet high; leaves unequally pinnate; leaflets serrated, oblong, obtuse; flowers capitate, terminal, white; July. Perennial; grows in meadows.

**SANICULA**. Sanicle. 5—2. Flowers separated, the central barren, the marginal fertile, without

stamens; calyx superior, of the barren flowers small, five-leaved, acute, of the fertile larger, nearly equal; petals of the barren flowers five, nearly equal, lance-shaped, inflected, channelled, compressed; of the fertile deciduous or wanting; filaments hair-like, spreading, twice as long as the petals; anthers roundish; germen roundish, bristly; styles reflected, awl-shaped, permanent; stigmas acute; fruit egg-shaped, acute, covered with hooked bristles, separable into two; seeds convex on the outer, flat on the inner side.

*S. CANADENSIS*, *Canadian Sanicle*: leaves all compound, sub-ternate; leaflets ovate, attenuate at base, mucronate, serrate; florets all sessile; stem one or two feet high; flowers white; June, July; perennial; grows in woods; common.

*S. MARILANDICA*, *Sanicle*: leaves all digitate; leaflets oblong, cut-



serrate: male flowers numerous,

stalked; stem two and a half feet high; flowers white and green; June; perennial; grows in woods and thickets.

*SAPONARIA*. Soapwort. 10  
2. Calyx inferior, of one leaf, tubular, with five teeth, permanent; petals five, with narrow angular claws, as long as the calyx, the limb flat, dilated towards the end; filaments awl-shaped, as long as the calyx; anthers oblong, obtuse; germen nearly cylindrical; styles two, erect, parallel, as long as the stamens; stigmas acute, downy; capsule oblong, one-celled, concealed in the calyx; seeds numerous, roundish.

*S. OFFICINALIS*, *Common Soapwort*: calyx cylindrical; leaves



spear-shaped, inclining to elliptical; a nearly smooth, somewhat succulent plant; stems about eighteen inches high, paniced in the upper part; flowers erect, flesh-colored or

white. The whole plant is bitter. When bruised and agitated in water, it raises a lather like soap, which washes greasy spots out of clothes. Perennial; flowers in July, August; grows by road-sides; naturalized.

**SARRACE'NIA.** Side-saddle-Flower. 13—1.

**S. PURPU'REA,** *Purple Side-saddle-Flower*: leaves radical, decum-



bent, short, inflated, contracted at the mouth, winged on the inside; mouth with a broad, heart-shaped appendage; scape one or two feet high, with a single terminal, nodding, reddish purple flower; June; perennial. One of the most singular and curious plants in nature. The little pitchers formed by the leaves, of the capacity of a wine-glass, are rarely found empty, but are generally about half full of wa-

ter. In this are numerous insects, which, in choosing the place for a retreat or for quenching their thirst, have unwarily *slipped in* and drowned. This circumstance, which may appear purely accidental, has been a sad puzzle to some physiological botanists, who have labored to consider the plant as carnivorous, as thus entrapping its unlucky prey, and then feasting at leisure.

**S. FLA'VA,** *Yellow Side-saddle-Flower*: leaves large, funnel-form; throat expanding; lateral wing nearly wanting; appendage erect, contracted at the base, reflexed at the sides; scape one or two feet high; flower yellow; June, July; grows in meadows.

There are several other species, all similar in general structure and habit. **S. PURPU'REA** is the only one which endures our northern winters; the others are common at the south.

**SAXIFRAGA.** Saxifrage. 10—2. Calyx inferior, half-inferior, or nearly superior, of one leaf, divided into five permanent segments, petals five, attached to the calyx, narrow at the base, spreading; filaments awl-shaped, spreading; anthers roundish, two-lobed; germen superior, or more or less infe-

rior, roundish, terminating in two short, spreading styles; stigmas obtuse; capsule nearly egg-shaped, two-beaked, two-celled; seeds minute, numerous, roundish.

**S. VIRGINIENSIS**, *Early Saxifrage*: leaves mostly radical, cuneate, obo-



vate, somewhat toothed, pubescent, shorter than the stalk; stem panicled; stem erect, pubescent, six or eight inches high; flowers white; April, May; perennial; grows in dry soils.

**S. PENNSYLVANICA**, *Pennsylvanian Saxifrage*: leaves oblong-lanceolate, hairy, toothletted; stem naked; peduncles alternate, in corymbose heads; stem two feet high; flowers green and yellow; May; perennial; grows in meadows.

**S. STELLATA**, *Starry Saxifrage*: leaves oblong, inclining to wedge-shaped, coarsely serrate, tapering and entire at the base; panicle corymbose, few-flowered; capsule superior; stalks about four inches high; flowers white, with two yellow spots at

the base of the petals; perennial; flowers in June; grows by rills, towards the summit of high mountains.

**S. NIVA'LES**, *Clustered Alpine Saxifrage*: leaves inversely egg-shaped, serrate, tapering, and entire at the base; cluster dense, few-flowered; capsule half-inferior. This species has great resemblance to the last, but is shorter and stouter; petals white, with two pale-green spots; perennial; flowers in June and July; grows in clefts of rocks on the summits of mountains.

**S. OPPOSITIFOLIA**, *Purple Saxifrage*: leaves egg-shaped, opposite, fringed, imbricated; flowers solitary, terminal; stems numerous, prostrate; flowers large, with purplish-red petals; perennial; flowers in May and June; grows in rocky places on mountains.

**S. HIE'COLIS**, *Yellow Marsh Saxifrage*: leaves lance-shaped, alternate, naked; calyx reflected, obtuse, fringed; capsule superior; stems simple, from four to eight inches high; flowers terminal, usually two or three, with deep yellow petals, dotted with red; perennial; flowers in August; grows in swamps.

**S. AIZOIDES**, *Yellow Mountain Saxifrage*: leaves alternate, linear,

fringed; capsule half-superior; stems decumbent at the base, then erect, from four to eight inches long, with a terminal panicle of yellow flowers, sprinkled with red dots; perennial; flowers in July, August and September; grows by rills in mountainous situations.

*S. RIVULARIS*, *Alpine Brook Saxifrage*: leaves palmate, stalked, the uppermost spatulate; stem few-flowered; root fibrous; germen half-inferior; leaves with five or three lobes; stem about two inches high, with a few small, white flowers; annual; flowers in June and July; grows by mountain rivulets.

*S. CÆSPITOSA*, *Tufted Alpine Saxifrage*: root-leaves crowded, three or five-cleft, obtuse, fringed, the lowermost undivided; stem erect, few-flowered; calyx obtuse; petals rounded, three-nerved; germen half-inferior. This species varies greatly in luxuriance, the number of flowers, and the degree of hairiness. Petals white, with green nerves; perennial; flowers in June; grows on the summits of high mountains.

*SCIR'PUS*. Club-rush. 3—1. Calyx an egg-shaped, concave chaff-scale; corolla none; spike of numerous flowers, all perfect; fila-

ments thread-like; anthers linear; style simple, deciduous; stigmas three, downy; seed three-cornered.

*S. TEN'UIS*, *Slender Club-rush*: culm filiform, quadrangular, eight to twelve inches high; spike terminal, oval, acute at each end; glumes ovate, obtuse; stamens three; styles three-cleft; flowers in July; grows in wet places; common.

*S. CÆSPITOSUS*, *Scaly Club-rush*: straw round, sheathed with numerous scales at the base, some of them bearing short leaves; two outer chaff-scales as long as the spike; straws numerous, from four to twelve inches high, growing in dense tufts, striated, upper sheaths ending in a short leaf; spike small, reddish-brown; perennial; flowers in July; grows on peat soil; abundant.

*S. TRIQUETER*, *Triangular Club-rush*: spikes lateral; stigmas two; straws three feet high, acutely triangular, with the sides hollowed, the point erect and sharp; a single, short leaf; spikes egg-shaped, in a panicle coming from the side of the straw, near the top; perennial; flowers in July.

*S. MARITIMUS*, *Salt-marsh Club-rush*: straw triangular; panicle ter-

minal, leafy; scales of the spikes three-cleft, the middle segment awl-shaped; stigmas three; straw from one to three feet high, leafy at the base and summit; leaves keeled, rough at the edges; spikes egg-shaped, reddish brown; perennial; grows on the banks of large rivers exposed to the tide, and in salt marshes.

*S. ACUTUS*, *Bull-rush*, *Great Club-rush*: straw round, leafless; panicle cymose, twice compounded; bractes two, shorter than the panicle; straws from four to six feet high, smooth, internally spongy; lower sheaths dark brown; a few short leaves at the base of the straw; spikes brown, forming a cyme or panicle; perennial; flowers in July; grows in pools, and the edges of rivers, in muddy bottoms.

The rushes constitute several numerous families of plants, which our limits will not admit of considering further. One or more species may always be met with in every wet soil, whether inland or on the sea-shore.

*SCLERANTHUS*. 10—2. Calyx inferior, of one leaf, tubular, with five shallow clefts, permanent, contracted at the neck; corolla none; filaments from five to ten, awl-shap-

ed, erect; anthers roundish, two-lobed; germen superior, roundish; styles thread-shaped, spreading, as long as the stamens; stigmas simple, downy; capsule egg-shaped, one-celled; seeds two, convex on one side, flat on the other.

*S. ANNuus*. *Annual Knowel*: calyx of the fruit with acute spreading



segments; stems spreading; root small, tapering; stems numerous, branched, and many-flowered above; leaves linear, acute, united at the base by a membranous fringed border; flowers small, green; annual; flowers in July; grows in dry fields.

*SCROPHULARIA*. Figwort. 14—2. Calyx of one leaf, with five rounded, somewhat unequal, marginal segments, much shorter than the corolla; corolla tubular, unequal, reversed; tube egg-shaped, large, inflated; limb very small, divided into five deep segments, the upper short, slightly notched, reflected, two lateral ones spreading,



two lower largest, erect, often accompanied by a small internal lobe; filaments declining, nearly as long as the corolla; anthers terminal, two-celled; germen egg-shaped; style simple, as long as the stamens; stigma simple; capsule egg-shaped or globular, pointed, two-celled, two-valved, the partition formed by the edge of the valves turned in; seeds numerous, small, attached to a globose central receptacle.

*S. MARILANDICA*, *Maryland Fig-wort*: leaves opposite, cordate, serrate, acute, rounded at the base; stem smooth, square, with blunt angles, four to seven feet high; flowers few, green or brownish; fascicles of the panicles lax; July; perennial; rare.

*SCUTELLA'RIA*. Scull-cap. 14—1. Calyx of one leaf, tubular, very short, slightly two-lipped, with four shallow, obtuse lobes, closed after flowering by a dorsal scale; corolla gaping, with a very short tube; upper lip concave, divided into three segments, the middle one cleft and concave, the other flat, acute, lower lip broader, divided into three shallow lobes; filaments concealed under the upper lip; anthers small, roundish, two-lobed;

germen four-lobed; style thread-shaped, as long as the stamens; stigma undivided, acute, incurved; seeds four, roundish, in the bottom of the calyx, and covered by the enlarged dorsal scale.

*S. LATERIFLORA*, *Side-flowering Scull-cap*: leaves smooth, with a scabrous keel, petioled; racemes lateral, axillary, leafy; stem square, much branched, one or two feet high; flowers small, blue; July; perennial; grows in meadows.

*S. GALERICULA'TA*, *Common Scull-cap*: leaves lance-shaped, crenate, wrinkled, heart-shaped at the base; flowers axillar; stem about a foot high, erect, leafy; flowers purplish-blue; perennial; flowers in July and August; grows in meadows.

*SENE'CIO*. Groundsel. 19—2. Common calyx double, the inner cylindrical, of numerous, equal, parallel, linear scales, the outer of minute imbricated scales at the base of the others, all withered-looking and generally black at the tip; compound corolla longer than the calyx; florets of the disk numerous, all perfect, tubular, with five equal segments, those of the ray strap-shaped, slightly toothed, without stamens, and sometimes wanting; filaments hair-like, short; anthers united into

a cylindrical tube; germen inversely egg-shaped, small; style thread-shaped, as long as the stamens; stigmas two, oblong, spreading; seed inversely egg-shaped; seed-down simple, sessile; receptacle naked, slightly convex.

*S. VULGARIS*, *Common Groundsel*: flowers destitute of ray; leaves pin-



natifid, toothed, half-embracing the stem; stem about six inches high, branched, with numerous corymbose yellow flowers; annual; flowers from February to November, but individuals may be got in flower through the winter; grows in cultivated and waste ground; common.

*S. HIERACIFOLIUS*, *Hawk-weed*, *Fire-weed*: heads flosculous; corolla naked; leaves oblong, amplexicaul, unequally and deeply toothed; stem virgate, two or three feet high; flowers terminal, erect, crowded, white; August, September; annual; grows by road-sides, and in

newly-cleared lands, where it is a troublesome weed.

*S. AUREUS*, *Golden Senecio*: corolla radiated; radical leaves ovate-cordate, serrated, stalked; cauline leaves pinnatifid, toothed; peduncles terminal, thickened; stem erect, smooth, two or three feet high; flowers yellow; June; perennial. A handsome plant, growing in meadows.

This is a numerous genus. Some of the species are met with everywhere. They are found within the tropics on both continents, and in the coldest regions of the globe.

*SILENE*. Catchfly. 10—3. Calyx inferior, of one leaf, tubular, with five teeth, permanent; petals five, claws narrow, as long as the calyx, bordered, limb flat, frequently cleft, either naked at the base, or furnished with two teeth; filaments awl-shaped, five alternate ones attached to the petals, and later than the rest; anthers oblong; germen cylindrical or egg-shaped; styles three, longer than the stamens; stigmas oblong, oblique, downy on the upper side; capsule egg-shaped, covered by the calyx, imperfectly three-celled, opening at the top with six teeth; seeds numerous, kidney-shaped.

*S. PENNSYLVANICA*, *Pennsylvanian Catchfly*, *Wild Pink*: viscid, pubes-

cent; root-leaves wedge-shaped; cauline leaves lanceolate; calyx



long, tubular; petals slightly emarginate, crenate; stem procumbent, a foot high; flowers red or purplish; June; grows in dry, gravelly soils.

*S. ANTIRRHINA*, *Snap-dragon Catchfly*: nearly smooth; leaves lanceolate, acute, ciliated; flowers small, paniced; stem erect, branched, somewhat leafy, a foot high; flowers red; July; grows in dry soils by road-sides, &c.

*S. QUINQUEVULNERA*, *Variegated Catchfly*: hairy; flowers lateral, alternate, erect; less hairy and less clammy than the preceding; petals not notched, their limb white, with a blood-red spot at the base; capsules erect; annual; flowers in June and July; grows in sandy corn-fields.

*S. INFLATA*, *Bladder Champion*,

*White Bottle*: flowers in panicles, drooping; petals cleft half-way down; calyx smooth, inflated, reticulated; stem erect; leaves egg-shaped, acute, glaucous; stem two or three feet high; calyx pale or purplish, beautifully reticulated with veins; petals white; perennial; flowers in July; grows in fields and pastures, and among rubbish; common. The boiled leaves taste like peas.

*S. ACUTULIS*, *Moss Champion*: stems tufted; leaves linear, acute, fringed at the base; stalks terminal, solitary, single-flowered; petals slightly notched, crowned; grows in dense tufts and patches towards the summits of mountains; flowers rose-colored; perennial; flowers in June and July.

*SINAPIS*. Mustard. 15. Calyx of four oblong, straight, spreading, deciduous leaves; petals inversely egg-shaped, rounded, entire, spreading, with linear, erect claws; filaments awl-shaped, erect; a gland at the inside of each of the outer, and one at the outside of each of the longer pairs; anthers oblong; germen cylindrical; style very short; stigma knobbed; pod nearly cylindrical, beaked; valves undulいた; partition membranous; the

beak also often contains a seed; seeds nearly globular, arranged in one row.

*S. ALBA*, *White Mustard*: pods bristly, knotty, shorter than their two-edged beak; leaves lyre-shaped; stem rough, about a foot and a half high; flowers large, yellow; eaten when young as salad; annual; flowers in July; grows in waste places and corn-fields.

*S. NIGRA*, *Common Mustard*: pods closely pressed to the stalk, four-cornered, smooth, with a short beak; lower leaves lyre-shaped, upper narrow lance-shaped, entire, smooth; stem from three to four feet high; flowers yellow; annual; flowers in June and July; grows in waste places and fields. The common mustard used at table is obtained from the seeds. It is also employed as a stimulant to the soles of the feet in fevers.

*SIUM*. *Water-parsnep*. 5—2. Flowers all uniform, and generally perfect; calyx superior, of five small, acute, unequal leaves; petals five, equal, inversely heart-shaped, with an inflected point; filaments thread-like, spreading, longer than the corolla; anthers roundish; germs egg-shaped, striated; styles cylindrical, spreading, swelling a

little at the base, shorter than the petals; stigmas obtuse; fruit egg-shaped, slightly compressed, furrowed, crowned with the permanent styles and withered calyx; seeds tumid, convex, each five-ribbed.

*S. LATIFOLIUM*, *Water-parsnep*: leaves pinnate, with lance-shaped,



equally serrate leaflets; umbels terminal; stem from three to six feet high, deeply furrowed, smooth; leaves with the stalks enlarged at the base and embracing the stem; flowers numerous, white, small; poisonous; perennial; flowers in June and July; grows in rivers, ditches and marshes.

*S. NODIFLORUM*, *Procumbent Water-parsnep*: leaves pinnate, with egg-shaped and equally serrate leaflets; umbels sessile, opposite to the leaves, stem procumbent; flowers

small, greenish-white, with slightly inflected petals; perennial; flowers in July and August; grows in ditches and rivulets. The juice is recommended in cutaneous diseases.

SM'LAX. 22—6.

*S. ROTUNDIFOLIA*, *Green Brier*: stem prickly, rounded; leaves roundish ovate, acuminate, pointed, slightly cordate, five-nerved, very smooth and shining; stem woody, very hard and strong; flowers white; June. This troublesome plant is common in moist woods, by brooks, rivers, &c., climbing on elders and small trees, and forming thickets that are next to impossible to penetrate.

*SOLA'NUM*. *Night-shade*. 5  
—1. Calyx inferior, of one leaf, divided into five acute, permanent segments; corolla of one petal, wheel-shaped; tube very short; limb much longer, reflected, plaited, divided into five acute segments; filaments awl-shaped, short; anthers much longer than the filaments, oblong, angular, close together, with two terminal pores; germs roundish; style thread-shaped, longer than the stamens, deciduous; stigma obtuse; berry roundish, glossy, with a terminal scar, two-celled; seeds numerous, roundish, com-

pressed, attached to a fleshy receptacle, connected with the partition.

*S. DULCAMA'RA*, *Bitter-sweet*, *Woody Night-shade*: stem shrubby,



undulated, thornless; upper leaves halbert-shaped; clusters cymose; stem branched, twining; lower leaves heart-shaped or egg-shaped; corolla purple, with two round green spots at the base of each segment; berries oval, scarlet. The root and leaves have been applied to various medicinal uses; the berries are poisonous. A shrub; flowers in June and July; grows in thickets.

*S. NI'GRUM*, *Common Night-shade*: stem herbaceous, thornless; leaves egg-shaped, toothed, angular; umbels lateral, drooping; stem branched, angular; flowers white; berries globular, black. The whole plant is fetid and narcotic, and has been employed medicinally. Annual;

flowers from June to September; grows in waste places near houses.

This genus, which is notorious for poison, contains some of our most useful plants, as the common potato, *S. tuberosa*, the *Tomato* or *Love-apple*, *S. lycopersicum*, and the *Egg-plant*, *S. melongena*.

**SOLIDA'GO.** Golden Rod. 19—2. Common calyx oblong, imbricated, with oblong, pointed, straight scales; compound corolla rayed; florets of the disk numerous, perfect, tubular, with five equal spreading segments; those of the ray from five to ten, strap-shaped, oblong, three-toothed, without stamens; filaments hair-like, short; anthers united into a cylindrical tube; germens oblong; style thread-shaped; stigmas two, revolute; seed somewhat inversely egg-shaped; seed-down sessile, hair-like; receptacle nearly flat, naked.

*S. CANADENSIS*, *Canadian Golden*



*Rod*: stem downy; leaves lanceo-

late, serrate, triple-ribbed, rough; flowers paniced; stem two feet high; flowers bright yellow, as are those of all the species; August; grows in pastures and woods, and by road-sides.

*S. GIGANTEA*, *Gigantic Golden Rod*: stem erect, smooth; leaves lanceolate, serrated, rough-edged, obscurely triple-ribbed; clusters paniculated, unilateral; stalks hairy; stem six feet high; flowers numerous; August, September.

*S. ALTISIMA*, *Tall Golden Rod*: stem erect, hairy; leaves lanceolate, the lower ones deeply serrated, very rough, rugose; panicles unilateral; stem about eight feet high; flowers numerous, in a branched panicle; September; perennial; common about the borders of fields.

*S. ODO'RA*, *Sweet-scented Golden Rod*: stem erect, striated, downy; leaves linear-lanceolate, entire, smooth, rough-edged; panicles clustering, unilateral, nearly simple; stem slender, two or three feet high; September; grows in woods and pastures; not common. This has a much more neat and delicate aspect than other species of the genus. Its leaves, which are bright and shining, have a somewhat pungent, pleasant taste and smell.

The plant has a place among the good housewife's herbs. A volatile oil which it yields by distillation is used in medicine.

**S. PROCE'RA**, *Great Golden Rod*: stem villose, erect; leaves lanceolate, serrate, rough, villose beneath; racemes spike-form, erect, drooping before flowering; rays short; height four to seven feet.

**S. AEROT'INA**, *Smooth Golden Rod*: stem erect, terete, smooth; leaves lance-linear, glabrous, serrate, rough-edged; racemes paniced; peduncles downy. The young leaves are edged with many little, stiff, white hairs.

**S. CILIA'RIIS**, *Fringed Golden Rod*: stem erect, glabrous; leaves lanceolate, somewhat three-nerved, glabrous, rough-edged, slightly serrate; racemes paniced; peduncle glabrous; bracts ciliate; rays short; the stem is angular; radical leaves petioled, oval, pointed, veiny, serrate, rough, near a foot long; branches of the panicle spreading; bracts minute.

**S. LATRIFLO'RA**, *Side-flowered Golden Rod*: stem erect, a little hairy; leaves lanceolate, slightly three-nerved, glabrous, rough-edged; lower ones sub-serrate; racemes

paniced, a little recurved, sub-scund; flowers large, the rays being much longer than the calyx; stem striated, often purplish, pinnatifid, with numerous lateral flowering branches; height two or three feet.

**S. AS'PERA**, *Rough Golden Rod*: stem erect, terete, hairy; leaves ovate, somewhat oval, very rough, rugose, serrate; racemes paniced; leaves one or two inches long, acute; racemes dense, somewhat conic; ray-florets twice as long as the calyx; height three or four feet.

**S. PAT'ULA**, *Spread Golden Rod*: stem erect, glabrous; leaves oval, serrate, glabrous, radical ones oblong-spatulate; racemes paniced, spreading; peduncles pubescent; stem wand-like, angular and striate; stem-leaves sessile, about an inch long, pointed; the radical ones resemble those of the ox-eyed daisy; racemes about an inch long; flowers rather large; height two feet.

**S. GRAMINIFOL'IA**, *Grass-leaved Golden Rod*: stem rough-haired, very furrowed, smoothish; leaves almost linear, entire, roughish, nearly erect, with three or five rough nerves; corymbs terminal, level-topped; flowers in heads; rays not longer than the disk; stem

leafy ; leaves sessile, grass-green, about two inches long, and a quarter of an inch wide ; flowers smallish ; calyx ovate, smooth, shining, with tumid green-tipped scales ; height four or five feet.

*S. CÆSIA*, *Blue-stem Golden Rod* : stem nearly erect, very smooth and even ; leaves lanceolate, glabrous, acuminate, with the margins and nerves roughish ; rays rather longer than the disk ; stem upright, somewhat zigzag, branched, leafy ; leaves about two inches long, subentire, sub-glaucous, paler beneath ; racemes numerous, short, rough-pedicelled ; bracts small, smooth, subulate ; height two or three feet.

*S. LÆVIGATA*, *Flesh-leaf Golden Rod* : stem erect, smooth ; leaves lanceolate, fleshy, entire, smooth in every part ; racemes paniced ; peduncles scaly, villose ; rays twice as long as the calyx ; tall, strong ; probably a variety of *mexicana* ; grows in salt marshes ; height four to six feet.

*S. LIMNIFOLIA* : stem oblique, glabrous ; leaves lanceolate, somewhat fleshy, entire, smooth on both sides ; racemes paniced, erect ; peduncles scaly, glabrous or subpubescent ; ray-florets elongated ; stem generally purple ; leaves some-

what clasping ; lower ones a foot long ; height three to five feet.

*S. FLEXICAULIS*, *Zigzag Golden Rod* : stem zigzag, glabrous, angled ; leaves lanceolate-acuminate, serrate, glabrous ; racemes axillary ; rays half as long again as the calyx ; stem slender, purplish, partly terete and partly angular ; leaves numerous, on short broad petioles, hardly two inches long, and half an inch wide, paler beneath ; the upper less serrate ; racemes much shorter than the leaves, the upper ones subcapitate ; height two or three feet.

*S. NOVEBORACENSIS*, *Star Golden Rod* : radical leaves oval-oblong, long-petioled, rough ; stem almost leafless, branched, furrowed, level-top corymbed ; rays twice as long as the tapering calyx ; stem strong, rough, furrowed, having leaves only at the origin of the flowering branches ; radical leaves with shallow serratures ; flowers large, resembling in form some asters ; calyx scales narrow, purplish ; height two or three feet.

This is a large family, generally of coarse-looking plants, very abundant in the United States, making a conspicuous appearance in the autumn. Only one species, *S. virgauræa*, is common to both continents



This, it seems, has been in great repute as a medicine. Gerard says "it is extolled above all other herbes for the stopping of blood in sanguinolent ulcers and bleeding wounds; and hath in times past bene had in greater estimation and regard than in these daies: for in my remembrance I have known the dry herbe, which came from beyond the sea, sold in Bucklersbury in London for halfe a crowne an ounce. But since it was found in Hamstead wood, eun as it were at our townes end, no man will give halfe a crowne for an hundred weight of it: which plainly setteth foorth the our inconsistancie and sudden mutabilitie, esteeming no longer of any thing, how pretious soeuer it be, than whilst it is strange and rare. This verifieth our English prouerbe, "Far fetcht, and deare bought, is best for Ladies."

SON'CHUS. Sow-thistle. 19—

1. Common calyx swelled at the base, of numerous, linear, imbricated, unequal scales; compound corolla imbricated, uniform; florets numerous, perfect, equal, strap-shaped, abrupt, with four or five teeth; filaments five, hair-like, very short; anthers united into a cylindrical tube; germen somewhat inversely

egg-shaped; style thread-shaped, as long as the stamens; stigmas two, reflected; seeds oblong, roughish, inclosed by the permanent calyx, which converges into a globular, pointed form; seed-down of many simple hairs, sessile; receptacle naked, dotted.

S. OLERA'CEUS, *Common Sow-thistle*: flower-stalks cottony, cymose;



calyx smooth; leaves runcinate, toothed; stem from one to two feet high, round, smooth, hollow; corolla pale yellow; subject to numberless variations, but in all its states easily distinguishable; annual; flowers from June to October; grows in cultivated ground, the borders of fields, and waste places; common.

SPARGANIUM. Bur-reed. 21

—3. Flowers arranged in several dense heads. Barren flowers numerous, in one or more superior heads; calyx of three or more oblong, equal, deciduous leaves; co-

rolla none; filaments three, hair-like, erect, longer than the calyx; anthers roundish, two-celled.

Fertile flowers numerous, in dense heads under the former; calyx of three or more oblong, equal, deciduous leaves; corolla none; germen superior, egg-shaped; stigma awl-shaped or egg-shaped, oblique, downy on one side, permanent; drupe inversely egg-shaped, beaked, dry, one-celled; nut solitary, egg-shaped.

*S. RAMOSUM*, *Branched Bur-reed*: leaves triangular at the base, their sides concave; common flower-stalks branched; stigma awl-shaped; stem erect, from two to three feet high; perennial; flowers in July and August; grows in ditches and by the sides of lakes and pools.

*SPERGULA*. *Spurrey*. 10—4. Calyx inferior, of five egg-shaped, obtuse, permanent leaves, membranous at the edges; petals five, egg-shaped, larger than the leaves of the calyx, undivided; filaments ten, sometimes five, awl-shaped, shorter than the corolla; anthers roundish, two-lobed; germen superior, egg-shaped; styles short, slender, spreading; stigmas downy; capsule egg-shaped, membranous, one-celled, five-valved; seeds roundish, compressed.

*S. ARVEN SIS*, *Corn Spurrey*, *Tares*:

leaves in whorls; stalks of the fruit reflected; root small, tapering; stems from six inches to a foot high, branched, swelling at the joints, hairy and clammy; leaves linear; stipules in pairs under each whorl; flowers in terminal panicles; petals white; seeds with a membranous border; annual; flowers in June and July; grows in corn-fields; abundant.

*SPIRÆA*. 12—2. Calyx inferior, of one leaf, with five acute, permanent, marginal segments; petals five, roundish, or oblong; filaments hair-like, nearly as long as the corolla; anthers roundish, two-lobed; germen five or more, superior, egg-shaped or oblong, compressed; styles, one terminating each germen; stigmas obtuse, spreading; capsules as many as the germen, oblong, pointed, compressed, two-valved, one-celled; seeds few, small, oblong.

*S. TOMENTO'SA*, *Hardhack*: leaves lanceolate, unequally serrate, dark green above, white and downy beneath; flowers doubly racemose; racemes terminal; stem about three feet high, woody, hard; flowers pale blue or purple; July, August. A very common plant in wet pastures, growing in tussocks or bunches.

The long, conical bunches of fruit remain through the winter, afford-



ing subsistence to the snow-birds, when almost every thing else fails them.

*S. SALICIFOLIA, Meadow Sweet*: leaves between elliptical and lance-



shaped, unequally serrate, smooth; clusters terminal, compound; a shrub, about four feet high, with smooth, straight stems and branches; flowers white, small, numerous, in terminal clusters; styles five; flowers in July; grows in moist situations.

*STAPHYLEA. Bladder-nut. 5*  
—3. Calyx inferior, of one leaf, concave, deeply divided into five colored segments, as large as the corolla; petals five, oblong, erect, similar to the calyx; nectary cup-shaped, central; filaments thread-shaped, erect, as long as the petals; anthers roundish; germen rather thick, with two or three deep divisions; styles two or three, erect, a little longer than the stamens; stigmas obtuse, close together; capsules two or three, inflated, united lengthwise; seeds two in each capsule, globular, with a circular pit at the side, and an oblique, lateral point.

*S. TRIFOLIA, Bladder-nut*: leaves trifoliate; racemes pendulous; pe-



tals below ciliated; fruit ovate; flowers in May, June. A fine shrub, six or eight feet high, with white flowers and very large, inflated capsules. Grows in woods.

**STATICE.** Sea Lavender. 5—  
6. Calyx inferior, of one leaf, funnel-shaped; tube contracted; limb undivided, plaited, membranous, permanent; corolla funnel-shaped, of five petals, contracted and united at the base, dilated upwards, obtuse, spreading; filaments awl-shaped, shorter than the petals; anthers oblong; germen roundish, very minute; styles thread-shaped, spreading, permanent; stigmas acute; capsule oblong, membranous, one-celled, one-valved, with five points, covered by the permanent calyx; seed solitary, oblong.

**S. CAROLINIANA,** *Marsh Rosemary*: stalks paniced; leaves ellipti-



cal, smooth, bristle-pointed; root woody, leaves leathery; panicle with several close spikes of erect, blue flowers; perennial; flowers in July and August; grows in salt marshes; the root is very astrin-

gent, and of importance in medicine.

**STELLARIA.** Stitchwort. 10—  
3. Calyx inferior, of five broadly lance-shaped, acute, spreading, permanent leaves; petals five, deeply cleft, spreading, oblong, withering; filaments thread-shaped, shorter than the petals, the five alternate ones shorter; five notched glandular nectaries at the base of the stamens; anthers roundish; germen roundish; styles three, hair-like, spreading; stigmas obtuse, downy; capsule egg-shaped, one-celled, six-valved, covered by the calyx; seeds numerous, roundish, compressed.

**S. ME'DIA,** *Chickweed Stitchwort*: leaves egg-shaped; stems procumbent, with a hairy alternating line on one side; stamens varying from three to ten; stem much branched, spreading, brittle; flowers small, with white petals; stamens three, five, or ten; poultry and small birds eat the seeds, and even the whole plant; annual; flowers all summer; grows everywhere in waste and cultivated ground.

**S. LONGIFOLIA,** *Stitchwort*: leaves between linear and lance-shaped, not serrate; panicle terminal, spreading; calyx three-ribbed, nearly as long as the petals; stems very weak

and brittle, supporting themselves by the surrounding plants, from one to three feet long; flowers with white petals; perennial; flowers in May, June and July; grows in grassy or bushy places.

## T.

### TANACE'TUM. Tansy. 19—

2. Common calyx hemispherical, imbricated, of numerous, oblong, close scales, the innermost membranous at the edges; compound corolla of two kinds of florets, those of the disk numerous, perfect, tubular, regular, with a five-cleft limb, those of the ray few, without stamens, tubular at the base, with a flat three-cleft limb; filaments hair-like, very short; anthers united into a cylindrical tube; germen inversely egg-shaped, compressed; style thread-shaped, as long as the stamens; stigmas obtuse, recurved; seed oblong, angular, crowned with a slight membranous border; receptacle convex, dotted, naked.

T. VULGA'RE, *Common Tansy*: leaves pinnatifid, deeply serrate; stems two or three feet high, terminating in a corymb of yellow flowers; the seeds are said to expel intestinal worms; perennial; flowers

in July and August; grows in the borders of fields, and by roads, generally near houses; introduced.

### TEU'CRUM. Germander. 14—

1. Calyx somewhat bell-shaped, a little unequal, tumid at the base, the limb deeply divided into five acute segments; corolla gaping; tube cylindrical, short, curved upwards; upper lip as if wanting, being divided to the base into two distant, lateral lobes; lower lip spreading, three-lobed, the central lobe largest; filaments much longer than the upper lip, ascending, curved; germen superior, four-cleft; style incurved; stigma divided into two acute, spreading segments; seeds four, oblong, wrinkled, in the bottom of the permanent calyx.

T. CANADEN'SE, *Wild Germander*: pubescent; leaves lanceolate, serrate, stalked; stem erect, about two feet high; spikes whorled, crowded; bractees longer than the calyx; flowers pale red or purple; July; perennial; grows by road-sides.

### THALIA. 1—1.

T. DEALBATA, *Mealy Thalia*: calyx two-flowered; culm reedy, powdered; leaves ovate, revolute at the apex; four feet high; flowers white; July; a beautiful aquatic plant of the southern states.

THUJA. *Arbor Vitæ*. 21—8.

T. OCCIDENTALIS, *Arbor Vitæ*:  
branches two-edged; leaves imbric-



cated, in four rows, ovate, rhomboid, appressed, naked, warted; cones obovate. In Lower Canada, New Brunswick, Vermont and the state of Maine, the *arbor vitæ* is the most multiplied of the resinous trees, after the black and hemlock spruces. A cool soil seems to be indispensable to its growth. It is never seen upon the uplands, among the beeches, birches, &c., but is found on the rocky edges of the innumerable rivulets and small lakes which are scattered over these countries, and occupies in great part, or exclusively, swamps from fifty to one hundred acres in extent, some of which are accessible only in the winter, when they are frozen and covered with several feet of snow.

The *arbor vitæ* is forty-five or fifty feet in height and sometimes more than ten feet in circumference; usually, however, it is not more than

ten or fifteen inches in diameter at five feet from the ground. A full-grown tree is easily distinguished by its shape and foliage. The trunk tapers rapidly from a very large base to a very slender summit, and is laden with branches for four-fifths of its height. The principal limbs, widely distant and placed at right angles with the body, give birth to a great number of drooping, secondary branches, whose foliage resembles that of the white cedar. On the borders of the lakes, where it has room and enjoys the benefit of the light and air, it rises perpendicularly, grows more rapidly, and attains a greater size than when crowded in the swamps, where its foliage intercepts the light and impedes the circulation of the air. In swamps its trunk is rarely straight, but forms the arc of an ellipse or less inclined. Its sides swell into two large ridges, which are a continuation of the principal roots. The foliage is evergreen, numerously ramified, and flattened or spread. The leaves are small, opposite, imbricated scales; when bruised they diffuse a strong, aromatic odor. The sexes are separate, upon the same tree. The male flowers, which appear in the month of May, are in

the form of small cones: to the female blossoms succeeds a yellowish fruit, about four lines in length, composed of oblong scales, which open through their whole length for the escape of several minute seeds surmounted by a short wing.

The bark upon the body is slightly furrowed, smooth to the touch, and very white when the tree stands exposed. The wood is reddish, somewhat odorous, very light, soft and fine-grained: in the northern part of the United States and in Canada it holds the first place for durability. From the shape of the trunk, it is difficult to procure sticks of considerable length and a uniform diameter; hence in the state of Maine it is little employed for the frame of houses, though in other respects proper for this object, and still less for the covering. It is softer than white pine, and gives a weaker hold to nails, for which reason the Canadians always join it with some more solid wood. The most common use of this tree is for rural fence, for which it is highly esteemed. The posts last thirty-five or forty years, and the rails sixty, or three or four times as long as those of any other species. The posts subsist twice as long in argillaceous as in

sandy lands. While the usage of such fences continues, the utmost economy should be practised in cutting the arbor vitæ according to the rules prescribed for resinous trees. In Canada it is selected for the light frame of bark canoes. Its branches, garnished with leaves, are formed into brooms, which exhale an agreeable, aromatic odor.

TILIA. Lime Tree. 13—1.

T. ALBA, *White Lime*: leaves cordate, sub-acuminate, unequal at



the base, serrated, white beneath, dark-green above, smooth; flowers yellow and green; July; fruit round, with five ribs; found in the middle and western states. The height of the white lime tree rarely exceeds forty feet, and its diameter twelve or eighteen inches. Its young branch-

es are covered with a smooth, silver-gray bark, by which it is recognised in the winter. The leaves are very large, denticulated, obliquely heart-shaped and pointed, of a dark green on the upper surface and white beneath, with small, reddish tufts on the angles of the principal nerves. This whitish tint is most striking on solitary trees exposed to the sun. The flowers come out in June, and, as well as the floral leaf, are larger than those of any other lime tree. The petals are larger and whiter, and are impregnated with an agreeable odor. The seeds are round, or rather oval, and downy. The wood of this tree is white and tender, and is seldom appropriated to any use in the arts.

*T. AMERICA'NA, Bass-wood, Broad-leaved Lime Tree:* leaves deeply cordate, abruptly acuminate, finely serrated, coriaceous, smooth; flowers yellow and green; July; common throughout the northern and middle states, and found on the mountains of the southern. In situations favorable to its growth, it sometimes attains an elevation of more than eighty feet, with a proportional diameter, and its straight, uniform trunk, crowned with an ample and tufted summit, forms a beau-

tiful tree. In newly-cleared lands the remains of these trees are distinguished by the numerous sprouts which cover the stumps, and the



large roots, whose growth can be prevented only by stripping off the bark or by the operation of fire. The leaves of this tree are alternate, large, nearly round, finely denticulated, heart-shaped at the base, and abruptly terminated in a point at the summit. The flowers put forth in the month of June, and are borne by long peduncles, are pendulous, subdivided at the extremity, and garnished with a long, narrow, floral leaf. The seeds, which are ripe about the first of October, are round and of a gray color. The trunk is covered with a very thin bark; the cellular integument, separated from



the epidermis and macerated in water, is formed into ropes; in Europe they are used for well-cords. The wood of this tree is white and tender: in the northern states, where the tulip tree does not grow, it is used for the panels of carriage bodies, and the seats of chairs; but as it is softer and splits more easily, it is less proper for these objects. On the Ohio, the images affixed to the prow of vessels are made of this wood instead of the white pine.

**T. PUBESCENS, Downy Lime Tree:** leaves truncate at base, sub-cordate,



oblique-denticulate, serrate, pubescent beneath; flowers yellow and green; July; found in the southern states. This tree is forty or fifty feet high, with a proportionate diameter. In its general appearance it resembles the American lime tree,

which grows farther north, more than the white lime tree, which belongs to the middle and western states. Its leaves differ widely in size, according to the exposure in which they have grown; in dry and open places they are only two inches in diameter, and are twice as large in cool and shaded situations. They are rounded, pointed at the summit, very obliquely truncated at the base, edged with fewer and more remote teeth than those of the other lime trees, and very downy beneath. The flowers, which appear in June, also, are more numerous and form larger bunches, and the seeds are round and downy. The wood is very similar to that of the other species, and is seldom appropriated to any use in the arts.

#### TRICHOSTEMA. 14—1.

**T. DICHOTOMA;** leaves oblong-ovate, attenuated towards the base, pubescent; stamens very long, exserted; stem a foot high; flowers purple; August; annual. An interesting little plant, with very beautiful, curious flowers. The shining, semi-transparent stamens, which are of a very delicate purple, form a beautiful arch, extending over from the upper to the lower lip of the corolla. Common in dry gravelly soil.

**TRIENTA'LIS.** 7—1. Calyx inferior, of seven linear, acute, spreading, permanent leaves; corolla of one petal, wheel-shaped, deeply divided into seven elliptical, flat, spreading segments; filaments thread-shaped, spreading, shorter than the corolla; anthers oblong, recurved; germen superior, round; style cylindrical, as long as the stamens; stigma obtuse; capsule globose, one-celled, seven-valved; seeds few, roundish, tunicated.

**T. EUROPE'A,** *Chickweed Winter-green*: leaves oblong; stem solitary, simple, erect, from three to six inches high, crowned with a tuft of leaves; flower-stalks from among the leaves, hair-shaped, simple; flowers white; perennial; flowers in June and July.

**TRIFOLIUM.** Trefoil. 17—4. Calyx inferior, tubular, five-toothed, permanent; corolla of four petals, all more or less united by their long claws, generally permanent, withering; standard reflected; wings oblong, shorter than the standard; keel of one petal, shorter than the wings; filaments ten, nine united into a compressed tube, the other hair-like, separate; anthers roundish; germen oblong; style awl-shaped, curved upwards; stigma

simple, smooth; legume short, membranous, one-valved, one-celled, not bursting, hardly longer than the calyx; seeds from one to four, roundish, smooth.

**T. REPENS,** *White Clover*: heads of flowers stalked, spherical, the flowers on short stalks; legume four-seeded, included within the calyx; stems creeping; leaflets inversely heart-shaped; stems from six to twelve inches long; flowers white, fragrant; leaflets generally brown on the back. A valuable pasture plant, supposed erroneously to indicate a rich soil. Perennial; flowers from May to September; grows in meadows and pastures, abundantly.

**T. PRATEN'SE,** *Red Clover, Honey-suckle*: heads dense, egg-shaped; stems ascending; petals unequal; lower calyx-tooth longer than the rest, which are equal; stipules egg-shaped, bristle-pointed; stems about a foot high; leaflets elliptical, entire, nearly smooth; flowers purple, sweet-scented. A valuable pasture plant, extensively cultivated; perennial; flowers in June and July; grows in pastures; common.

**T. ARVEN'SE,** *Hare's-foot Trefoil, Kitten's-Feet*: heads oval, very hairy; stipules lance-shaped, bris-

the-pointed; calyx-teeth longer than the corolla, permanently bristle-shaped; leaflets narrow, inversely egg-shaped; stem from four inches to a foot high, erect, branched; flowers with pale red or white petals; annual; flowers in July and August; grows in dry pastures and fields.

*T. PROCUMBENS*, *Hop Trefail*: heads oval, many-flowered; standard finally deflected, furrowed; stems spreading or procumbent; common leaf-stalk longer than the middle partial leaf-stalk; stems very numerous, spreading all round, from four inches to a foot long; heads of about fifty bright yellow flowers. Annual; flowers in June and July; grows in dry pastures; common.

*T. OFFICINALE*, *Melilot*: clusters with the flowers pointing one way; legume protruding, acute, transversely wrinkled, hairy, two-seeded; stem erect; stipules awl-shaped; stem two or three feet high, erect, branched, angular; leaflets serrate; flowers yellow, in axillar, long-stalked clusters. In drying it emits a strong smell, resembling that of new hay; cultivated as food for cattle. Annual; flowers in June and July; grows in thickets and borders of fields.

**TRIGLOCHIN.** *Arrow-grass*. 6—3. Calyx inferior, of three roundish, deciduous leaves; petals three, egg-shaped, a little longer than the calyx; filaments very short; anthers large, roundish, two-lobed; germen superior, large, oblong; styles none; stigmas three or six, reflected, feathery; capsule oblong, with as many cells as there are stigmas; seeds solitary, oblong, pointed.

*T. MARITIMUM*, *Sea Arrow-grass*: capsule six-celled, egg-shaped;



leaves radical, semi-cylindrical; larger than the last. It has a salt taste, and cattle, especially cows, are fond of it. Perennial; June, July; grows in salt marshes.

**TYPHA.** *Cat's-Tail*. 21—3. Barren flowers numerous, arranged in a dense, cylindrical, hairy, terminal catkin, the common stalk of which is hairy or scaly; calyx none; corolla none; anthers about three,

oblong, furrowed, drooping, placed on a common filament.

Fertile flowers numerous, in the lower part of the same catkin; calyx none; corolla none; germen superior, oblong, stalked; style hair-like; stigma simple; seed solitary, egg-shaped, on a bristly stalk.

*T. LATIFO'LIA*, *Great Cat's-Tail*, *Reed Mace*: leaves linear, somewhat convex beneath; catkin continuous, its common stalk hairy; stems about six feet high, erect, round, leafy at the bottom; catkin about a foot long, brown. Perennial; flowers in July; grows in the borders of ponds, lakes and rivers.

*T. ANGUSTIFO'LIA*, *Reed Mace*: leaves linear, convex beneath, chan-



nelled above; barren and fertile catkins separated from each other, the common stalk scaly; stems

about four feet high. Perennial; flowers in June and July; grows in pools and ditches.

## U.

*UL'MUS*. Elm. 5—2. Calyx inferior, of one leaf, turbinate, wrinkled, permanent; the limb divided into five, sometimes four or six, erect segments, internally colored; corolla none; filaments generally five, awl-shaped, twice as long as the calyx; anthers erect, short, with four furrows; germen oblong, compressed, cleft; styles two, terminal, spreading, shorter than the stamens; stigmas downy; capsule membranous, round or oblong, notched at the end, one-celled; seed solitary, roundish, slightly compressed.

*U. ALA'TA*, *Wahoo*, *Winged Elm*: leaves oblong-ovate; fruit hairy.



closely fringed; common in the

southern, and some parts of the western states.

It is of a middling stature, commonly not exceeding thirty feet, with a diameter of nine or ten inches. The branches are furnished throughout their whole length, on two opposite sides, with a fungous appendage, two or three lines wide, from which the name of *alata*, winged, has been given to the species. The leaves are borne by short petioles, and are oval, denticulated, and smaller than those of the white and red elms. The flowers, like those of other elms, open before the leaves. The seeds are fringed, and differ from those of the white elm only by a little inferiority of size.

The wood of this tree is fine-grained, more compact, heavier and stronger than that of the white elm. The heart is of a dull red approaching to chocolate color, and always bears a large proportion to the sap. In South Carolina, it is employed for the naves of coach wheels, and is preferred for this object to the tupelo, as being harder and tougher; but it is appropriated to no other particular use.

U. AMERICA'NA, *White Elm*: leaves ovate, acuminate, serrate, unequal at base; fruit villous at edge;

common in the northern, middle, and western states.

In the middle states, the white elm stretches to a great height, but



does not approach the magnificence of vegetation which it displays in the countries peculiarly adapted to its growth. In clearing the primitive forests a few stocks are sometimes left standing; insulated in this manner, it appears in all its majesty, towering to the height of eighty or one hundred feet, with a trunk four or five feet in diameter, regularly shaped, naked, and insensibly diminishing to the height of sixty or seventy feet, where it divides itself into two or three primary branches. The limbs, not widely divergent near the base, approach and cross each other eight or ten

feet higher, and diffuse on all sides long, flexible, pendulous branches, bending into regular arches and floating lightly in the air. A singularity in this tree which exists in no other—two small limbs four or five feet long, grow in a reversed position near the first ramification, and descend along the trunk, which is covered with a white, tender bark, very deeply furrowed. The leaves of this tree are four or five inches long, borne by short petioles, alternate, unequal at the base, oval-acuminate and doubly denticulated. They are generally smaller than those of the red elm, of a thinner texture and a smoother surface, with more regular and prominent ribs. It differs, also, essentially from the red and European elm in its flowers and seeds; it blooms in the month of April, previous to the unfolding of the leaves; the flowers are very small of a purple color, supported by short, slender foot-stalks, and united in bunches at the extremity of the branches. The seeds are contained in a flat, oval, fringed capsule, notched at the base; the season of their maturity is from the 15th of May to the first of June.

The wood of this tree, like that of the European elm, is of a dark

brown, and, cut transversely or obliquely to the longitudinal fibres, it exhibits the same numerous and fine undulations; but it splits more easily, and has less compactness, hardness and strength. This wood is used at New York and farther north for the naves of coach wheels. It is not admitted into the construction of houses or of vessels, except occasionally in the state of Maine for keels, for which it is adapted only by its size. Its bark is easily detached during eight months of the year; soaked in water and supplied by pounding, it is used in the northern states for the bottoms of common chairs. The wood makes good fuel, and produces ashes strongly impregnated with the alkaline principle.

U. FULVA, *Red Elm*, *Slippery Elm*: leaves doubly serrate, unequal at base; axils of the veins bearded beneath; fruit not fringed; thinly disseminated throughout the northern, middle and western states. It is fifty or sixty feet high, and one or two feet in diameter. In the winter it is distinguished from the white elm by its buds, which are larger and rounder, and which, a fortnight before their development, are covered with a russet down.

The leaves are oval-acuminate, doubly denticulated, and larger, thicker and rougher than those of the white elm, and emit an agreeable odor. It blooms in the month of April. The flowers are aggregated at the extremity of the young shoots. The scales which surround the bunches of flowers are downy like the buds. The flowers and seeds differ from those of the wahoo; the calyx is downy and sessile, and the stamens are short and of a pale rose-color; the seeds are larger, destitute of fringe, round, and very similar to those of the European elms; they are ripe about the last of May.

The bark upon the trunk is brown; the heart is coarse-grained and less compact than that of the white elm, and of a dull-red tinge. The wood, even in branches of one or two inches in diameter, consists principally of alburnum or sap. This species is stronger, more durable when exposed to the weather, and of a better quality than the white elm; hence, in the western states, it is employed with greater advantage in the construction of houses, and sometimes of vessels on the banks of the Ohio. It is said to be the best wood in the United States for blocks, and its scarceness

in the Atlantic states is the only cause of its limited consumption in the ports. It makes excellent rails, which are of long duration, and are formed with little labor, as the trunk divides itself easily and regularly: this is probably the reason that it is never employed for the naves of wheels. This tree bears a strong resemblance to a species or a variety in Europe known by the name of *Dutch Elm*; the bark of which is very mucilaginous, and also contains sugar, a little gallic acid and super-tartrate of potass. The leaves and the bark of the branches, macerated in water, yield a thick and abundant mucilage, which is used for a refreshing drink in colds. The bark, when reduced to flour, is said to make excellent puddings.

URTICA. Nettle. 21—4. Barren flower: calyx of four, roundish, concave, equal leaves; petals none; nectary central, cup-shaped; filaments four, awl-shaped, spreading, as long as the calyx; anthers roundish, two-lobed. Fertile flower: calyx inferior, of two roundish, equal leaves; corolla none; germen egg-shaped; style none; stigma downy; seed one, naked, egg-shaped, somewhat compressed, polished, embraced by the permanent calyx.

*U. dioica*, *Large Stinging Nettle* : leaves opposite, heart-shaped ;



clusters much branched, in pairs, mostly dioecious ; from two to four feet high, dull green, with venomous stings ; the fibres of the stem may be used like hemp.

*U. urens*, *Small Nettle* : leaves opposite, broadly elliptical, with about five longitudinal ribs ; clusters nearly simple ; from one to two feet high, bright green, with venomous stings ; annual ; flowers from June to October ; grows in cultivated ground and waste places.

**UTRICULARIA.** *Hooded Milfoil.* 2—1. Calyx of two small, egg-shaped, equal leaves ; corolla masked ; upper lip flat, obtuse, erect ; lower lip with a prominent heart-shaped palate ; spur projecting from the base ; stamens short ; an-

thers small, adhering together ; germen globose ; style thread-shaped, as long as the calyx ; capsule large, globose, one-celled ; seeds numerous, small.

*U. vulgaris*, *Bladderwort* : spur conical ; upper lip of the corolla as long as the palate ; leaves divided into numerous segments ; stems much branched, lying prostrate in the water ; leaves small, with very slender divisions, having minute prickles at the margin ; scape erect, round, bearing from three to eight bright yellow flowers, arranged in a bunch ; lower lip much larger than the upper, with a projecting palate closing the mouth ; spur curved, acute ; the roots, stems and leaves are covered with numerous vesicles, having an aperture closed by a valve, and its margin armed with bristles. In the earlier stages these vesicles are filled with water, and when it becomes necessary for the plant to rise and expand its flowers in the air, they become filled with air ; after some time, the air in the vesicles is substituted by water, and the plant descends to ripen its seeds. Perennial ; flowers in July ; grows in ditches and pools.



## V.

**VACCINIUM.** Whortleberry, Huckleberry. 8—1. Calyx superior, very small, permanent, four-toothed; corolla of one petal, bell-shaped, with four revolute segments; filaments awl-shaped, flattened, fixed to the receptacle; anthers oblong, with two points, erect, terminal; germen inferior, roundish; style simple, cylindrical, erect, longer than the stamens; stigma obtuse; berry globular, with a central depression, four-celled; seeds few, small.

**V. RESINOSUM,** *Common Whortleberry*: racemes bracted; corollas



ovate; leaves elliptic, somewhat acute, entire, deciduous, sprinkled with resinous dots underneath; about two feet high; flowers in lateral clusters, reddish-green; berry black, sweet; June; a well-known shrub of our woods and pastures.

**V. ULIGINOSUM,** *Great Bilberry, Bog Whortleberry*: flower-stalks one-flowered; leaves inversely egg-shaped, entire, smooth; branches round; about two feet high; corolla flesh-colored; berry large, bluish-black; a shrub; flowers in June; grows on the tops of our highest mountains.

**V. VITIS-IDEA,** *Red Whortleberry, Cow-berry*: clusters terminal, drooping; leaves inversely egg-shaped, revolute, minutely toothed, dotted beneath; corolla bell-shaped; stems from three to six inches high; flowers flesh-colored; berry deep red. The berries are very acid and rather harsh, but are made into jelly and rob. A shrub; flowers in June.

**V. TENELLUM,** *Low Blueberry*: branches angular, green; leaves sessile, ovate-lanceolate, mucronate; fascicles clustered, terminal, sessile; corolla ovate; height twelve to eighteen inches leaves shining on both sides; flowers white; May; berry blue, sweet and wholesome; abundant in hilly pastures.

There are many other species of vaccinium, known as *Bilberries, High Blueberries, Huckleberries, &c.* Their rich, pulpy berries give them a prominent place in the botany of children, who, with their baskets,

may be seen at the proper season studying some of their peculiarities with a good deal of interest.

**VERA'TRUM.** 23—1.

*V. VIRIDE*, *Poke Root*, *American Hellebore*: racemes panicled; brac-



teas of branches oblong-lanceolate, partial, longer than the downy petioles; root thick, fleshy; stem three to five feet high, round, solid, pubescent; leaves large, oval-acuminate, pubescent, nerved, plaited, investing the stem; flowers green; June; perennial; a large, handsome plant of our meadows and swamps.

**VERBAS'CUM.** Mullein. 5—1. Calyx inferior, of one leaf, deeply divided into five erect, acute, nearly equal, permanent segments; corolla of one petal, wheel-shaped, unequal, the tube very short, the limb spread-

ing, deeply divided into five rounded segments; filaments awl-shaped, unequal, declining, woolly, shorter than the corolla; anthers kidney-shaped, compressed; germen roundish; style thread-shaped, slightly swelling upwards, declining, rather longer than the stamens; stigma obtuse; capsule egg-shaped, two-celled, two-valved; partition double, frequently incomplete; seeds numerous, minute, angular, covering the egg-shaped or globular central receptacle.

*V. THAP'SUS*, *Common Mullein*: leaves decurrent, woolly on both sides; stem simple; cluster dense; root spindle-shaped; stem erect, three or four feet high, woolly; flowers nearly sessile, large, golden yellow; biennial; flowers in July and August; grows in waste ground, in sandy or gravelly soil.

*V. BLATTARIA*, *Moth Mullein*: leaves embracing the stem, oblong, smooth; stem branched above, each branch terminating in a simple cluster; flower-stalks longer than the bracteas; stem three or four feet high, erect, leafy, smooth; flowers yellow, stained with brown at the back; annual; flowers in July; grows in gravelly soil.

*V. LYCHNITIS*, *White Mullein*:

leaves oblong, inclining to wedge-shaped, nearly smooth on their upper side; stem angular, paniced; stem erect, about three feet high, woolly; flowers stalked, rather small, cream-colored; biennial; flowers in July and August; grows in waste places.

**VERBENA.** Vervain. 14—2. Calyx tubular, angular, with five marginal teeth, one rather shorter than the rest; corolla unequal; tube cylindrical, straight, twice as long as the calyx; limb spreading, divided into five deep, rounded, somewhat unequal segments; filaments two or four, bristle-shaped, very short, incurved, within the tube of the corolla; anthers of two rounded lobes; germen four-cornered; styles slender, as long as the tube; stigmas obtuse; seeds two or four, oblong.

**V. HASTATA,** *Common Blue Vervain*: leaves opposite, lanceolate, acuminate, cut-serrate, hastate; spikes erect, paniced; stem erect, two to four feet high; flowers deep-blue or purple; July to September; perennial; a tall, rough-looking, but handsome plant; common by roadsides, about houses, &c.

**V. URTICIFOLIA,** *Nettle-leaved Vervain*: erect, sub-pubescent; leaves

ovate-acute, serrate, petiolate; spikes filiform, distinct, axillary, terminal; stem two or three feet high; flowers small, white; July, August; perennial; grows among the rubbish of slovenly premises.

The vervain was once a plant of great consequence; it was the enchanter's plant, and no sorcery could be carried on without it. It was also thought to cure the bite of mad dogs and the stings of venomous reptiles, make friends of bitter enemies, &c.; but the plant has no reputation now, and we have had little use for it since the time of Moll Pitcher.

**VERNONIA.** 19—1.

**V. NOVEBORACENSIS,** *Vernonia*: leaves lanceolate, scabrous, serrulate; corymb fastigiate; scales of involucre filiform at the ends; stem four or five feet high, branching at top, furrowed; flowers dark purple; September; perennial; a very showy plant, common in wet places, in meadows, by road-sides, &c.

**VERONICA.** Speedwell. 2—1. Calyx inferior, with four unequal segments, permanent; corolla wheel-shaped, permanent, its limb divided into four unequal segments, of which the lower is smallest; filaments spreading, tapering down-

wards; anther oblong; germen compressed; style thread-shaped, declining, as long as the stamens; stigma small, notched; capsule more or less universally heart-shaped, compressed, two-celled, four-valved; seeds numerous, roundish.

V. SERPYLLIFOLIA, *Smooth or Thyme-leaved Speedwell*: clusters somewhat spiked; leaves egg-shaped, slightly crenate; capsule inversely heart-shaped, shorter than the style; root of long, white fibres; stem about five inches high, decumbent and rooting at the base, branched, leafy; leaves opposite, with short stalks, slightly hairy, three-nerved; bractees elliptical; flowers of a delicate pale blue, reddish before they are fully expanded, with deep blue lines; perennial; flowers in May and June; pastures and road-sides.

V. ALPINA, *Alpine Speedwell*: cluster corymbose; leaves elliptical, egg-shaped, somewhat serrate; capsule egg-shaped, longer than the style; root creeping; stem about four inches high, simple, ascending, rooting at the base, leafy; leaves opposite, smooth, nearly sessile; bractees and segments of the calyx ciliated; flowers small, bright blue; perennial; flowers in June and Ju-

ly; grows by the margins of rills, near the summits of mountains.

V. BECCABUNGA, *Short-leaved Water Speedwell*, or *Brooklime*: clusters opposite; leaves elliptical, obtuse, somewhat serrate, smooth; stem procumbent, rooting at the base; the whole plant succulent and glossy; stems decumbent, generally floating; flowers blue, in long, stalked clusters; perennial; flowers in June and July; grows in brooks and in ditches with running water.

V. ANAGALIS, *Long-leaved Water Speedwell*, or *Brooklime*: clusters opposite; leaves lance-shaped, acute, distinctly serrate, smooth; the whole plant succulent and glossy; stems erect, from one to three feet high; flowers pale blue, frequently purplish; perennial; flowers in June and July; brooks, ditches and pools.

V. SCUTELLA'TA, *Narrow-leaved Marsh Speedwell*: clusters alternate; leaves oblong or linear, somewhat toothed; fruit-stalks bent backwards; the whole plant slender; stems weak, spreading, sometimes decumbent and rooting, from nine to twelve inches high; leaves sometimes entire at the margin; fruit-stalks remarkably spreading; flowers whitish, streaked with blue;

perennial; flowers in June and July; grows in marshy places with gravelly soil.

*V. OFFICINALIS*, *Common Speedwell*: clusters spiked; leaves broadly elliptical, serrate, rough with short hairs; stems prostrate, hairy, rooting at the base, from six to eighteen inches long; leaves with short stalks, stiffish, pale green; spikes of numerous light blue or purplish flowers, veined with deeper blue; partial flower-stalks shorter than the bractes; capsule inversely heart-shaped; perennial; flowers in June; grows on dry banks, in open pastures, and in dry woods.

*V. AGRESTIS*, *Procumbent Chickweed Speedwell*: leaves egg-shaped,



deeply serrate, the lower ones opposite; flower-stalks about equal to the leaves in length, curved when in fruit; corolla shorter than the calyx; seeds cupped; root small; stem hairy on two opposite sides, branched at the base, spreading, leaves broad, with short stalks;

corolla small, bright blue; capsule two-lobed, tumid, rough; annual; flowers from May to September; grows in cultivated fields.

*V. ARVENSIS*, *Wall Chickweed Speedwell*: leaves heart-shaped, broadly serrate, lower ones stalked, upper lance-shaped, sessile; stems nearly erect; leaves nearly sessile; corolla small, pale blue, with deeper lines; capsule inversely heart-shaped, compressed, ciliated; annual; flowers in May and June; on the tops of walls, in dry fields, and among rubbish.

*V. HEDERIFOLIA*, *Ivy-leaved Chickweed Speedwell*, *Small Henbit*: leaves broadly heart-shaped, five-lobed; segments of the calyx heart-shaped, acute, ciliated; seeds cupped, wrinkled; stems procumbent, spreading; leaves flat, generally five-lobed, the upper three-lobed; flowers small, pale blue, with deeper lines; capsule two-lobed, turgid; annual; flowers from March to December; grows in cultivated fields, in woods and among rubbish.

*VIBURNUM*. 5—3. Calyx superior, minute, of one leaf, deeply divided into five segments, permanent; corolla of one petal, bell-shaped, with five obtuse, spreading segments; filaments awl-shaped,

spreading, as long as the corolla; anthers roundish; germen roundish; style none; stigmas three, sessile, obtuse; berry roundish, one-celled; seed solitary, roundish, compressed.

*V. PYRIFOLIUM*, *Pear-leaved Viburnum*: smooth; leaves opposite, ovate, nearly acute, sub-serrate; leaf-stalks smooth; fruit ovate; cymes stalked, nearly sessile; flowers white; June; a small shrub of our northern mountains.

*V. LENTA'GO*, *Sweet Viburnum*: leaves broad-ovate, acuminate, finely and sharply serrated; stalks edged, curled; flowers white; July; a tall, handsome shrub, growing in low grounds, yielding a pleasant-tasted fruit.

This genus contains several other species. They are all handsome shrubs, and some are found in our gardens. The *Guelder Rose*, or *Snow-ball*, is the *V. opulus*, a well-known garden species, with a profusion of large bunches of white flowers.

*VICIA*. Vetch. 17—4. Calyx inferior, tubular, unequal, with five acute segments, the two uppermost shorter; corolla of five petals; standard largest, oval, ascending, the sides deflected. the back some-

what keeled; wings oblong, appressed each other, shorter than the standard; keel rounded, compressed, of two united petals, with separate claws; filaments ten, nine united into a compressed tube, open at the upper edge, the other hair-like, separate; anthers small, roundish; germen oblong, compressed; style short, ascending at a right angle, cylindrical; stigma obtuse, with a tuft of hairs in front, below the summit; legume long, compressed, pointed, one-celled, with two leathery, stiffish valves; seeds several, roundish.

*V. CRACCA*, *Tufted Vetch*: flowers in imbricated clusters; leaflets



lance-shaped, downy; stipules half arrow-shaped, nearly entire; stems two or three feet long; flowers variegated with purple and blue; an excellent pasture plant. Perennial;

flowers in July and August; grows in thickets, fences and pastures.

**V. SYLVATICA**, *Wood Vetch*: leaflets elliptical; stipules crescent-shaped, deeply-toothed; stems numerous, climbing, five or six feet long; flowers numerous, in clusters longer than the leaves; petals bluish-white, veined with blue. Perennial; flowers in July and August; grows in bushy places at the south.

**V. SATIVA**, *Common Vetch*: flowers nearly sessile, commonly in pairs; leaflets oblong, lower ones abrupt; stipules toothed, impressed with a dark spot; seeds smooth; stems procumbent or climbing, from two to three feet long; leaflets from six to ten; flowers variegated with crimson, blue and white. Perennial; flowers in May and June; grows in corn-fields.

The well-known *Windsor* and *Magazan* beans are varieties of *V. faba*. They are among the most important and nutritious of our garden plants.

**VIOLA**. Violet. 5—1. Calyx inferior, of five oblong, acute, equal, erect, permanent leaves, produced downwards beyond their insertion, two of them under the uppermost petal, one under each of the lateral

petals, and one under the two lower; corolla irregular, of five unequal petals, the uppermost broadest, slightly cleft, directed downwards, terminating at the base in a curved spur, projecting between the leaves of the calyx; two lateral petals opposite, equal, obtuse, straight; two lower equal, larger, and directed upwards; filaments very small; anthers broad, close together, obtuse, each with a membranous point; germen superior, roundish; style thread-shaped, extending beyond the anthers; stigma oblique; capsule egg-shaped, one-celled, three-valved; seeds several in each cell, egg-shaped, attached to a linear receptacle in the middle of each valve.

**V. CUCULLATA**: glabrous; leaves cordate, somewhat acuminate, crenate-dentate; autumnal ones largest, very exactly reniform; peduncle somewhat four-sided, longer than the leaves; divisions of the calyx subulate, acuminate, emarginate behind or very entire; petals (as in many American species) oblique, veiny, very entire, white at the base, upper one generally naked, glabrous, lateral ones bearded, and, with the upper one, marked with a few blue lines.

**V. AFFINIS**: glabrous; leaves cordate-ovate, sub-acuminate, crenate-dentate; peduncle somewhat four-sided, shorter than the leaves; divisions of the calyx emarginate or very entire behind, lance-ovate, sub-obtuse, two upper ones ovate; petals all very entire, veiny, and white at the base, upper one generally villose, lateral ones bearded, and, with the upper one, marked with a few blue lines; height one to six inches.

**V. PALMATA**: mostly villose; leaves heart-renaliform, palmate, five to seven-lobed; leaves polymorphous, often narrow and gashed, middle one always larger; sometimes villose both sides, sometimes only beneath, often glabrous, all of them very often purple beneath; the first spring ones are ovate, entire; petioles sub-emarginate; peduncle somewhat four-sided, longer than the leaves; divisions of the calyx lance-ovate, ciliate, very entire behind; petals all very entire, veiny, and white at the base, upper ones narrower, smaller, sometimes villose at the base, yet often naked, glabrous; lateral ones densely bearded, and, with the upper one, marked with a few blue lines; one variety has white flowers; height

three to six inches; grows in woods at the south.

**V. CONGENER**: always villose; leaves broad-ovate, cordate, sub-reniform, crenately and coarsely toothed, sometimes sub-lobate and lobed, decurrent into the subulate, very villose, large, strong petioles; peduncles somewhat four-sided, shorter than the leaves; divisions of the calyx ciliate, ovate, obtuse, very entire behind; petals all very entire, veiny, white at the base, upper one narrower, generally naked, glabrous, yet sometimes the base is villose; lateral ones densely bearded, and, with the upper, marked with a few blue lines. A variety has the corol of very deep violet color; Canada to Florida.

**V. ASARIFOLIA**: villose; leaves very large, sub-ovate-renaliform, crenate, dentate, decurrent into the petioles, always entire; peduncles somewhat four-sided, short, (rarely an inch and a half long); divisions of the calyx ovate, ciliate, entire or emarginate behind; petals all very entire, veiny, white at the base, upper one glabrous, naked, lateral ones densely bearded, and, with the upper one, marked with a few blue lines.

**V. SORORIA**: leaves thickish, flat,



appressed to the earth, orbicular and round-ovate, cordate, crenate, sinus at the base often closed, villose above, with the hairs erect, beneath glabrous, and generally becoming purple; petioles short, strong, with small stipules at the base; peduncle somewhat four-sided, of the length of the leaves; divisions of the calyx short, subulate, obtuse, glabrous, very entire behind; petals obovate, short, all very entire, veiny, white at the base, upper and lateral ones bearded, and marked with a few lines; dry woods.

V. EMARGINATA: glabrous; leaves somewhat succulent, oblong-ovate, or even triangular-ovate, cordate, dentate, sometimes ciliate, upper ones unequally and coarsely gash-toothed at the base, and often decurrent into the petiole; midrib prominent; petioles sometimes villose; peduncle four-sided, longer than the leaves; divisions of the calyx lanceolate, acute, emarginate behind; petals veiny, white at the base, all emarginate, villose, and the upper one densely villose, lateral ones bearded, and, with the upper one, marked with a few blue lines; dry woods.

V. SAGITTATA: glabrous; leaves

ciliate, oblong, not acute, sagittate-cordate, dentate, gashed at the base, or furnished with elongated, divaricate teeth; peduncle somewhat four-sided, longer than the leaves; divisions of the calyx lanceolate, acuminate, emarginate behind; petals all very entire, veiny, white at the base, upper one generally naked, glabrous, lateral ones densely bearded, and, with the upper one, marked with a few blue lines; spur elongated behind; a variety has the leaves more or less villose; dry soils.

V. OVATA: villose; leaves ciliate, oblong-ovate, sub-acute, cordate, often oblique at the base, decurrent into the petiole, upper ones gashed at the base; petioles shortish; divisions of the calyx ciliate, ovate, or broad-lanceolate, more or less elongated behind and deeply emarginate or eared; petals all very entire, veiny, white at the base, upper one naked, glabrous, lateral ones very densely bearded, and, with the upper one, marked with a few blue lines; spur broad, generally elongated; dry soils; height two to four inches.

V. AMOE'NA: glabrous; leaves ovate, sub-acuminate, crenate, sometimes sub-villose above; petioles long, spotted with red; peduncle

somewhat four-sided, equalling or exceeding the length of the leaves, spotted; divisions of the calyx lanceolate; petals all very entire, green at the base, lateral ones sometimes with the base pubescent, and, with the upper one, marked with a few blue lines; moist woods; flowers odorous.

V. *HLANDA*: glabrous; leaves round, sometimes sub-ovate, cordate, crenate, appressed to the earth, sometimes with a few scattering hairs above; petioles pubescent; peduncle somewhat four-sided, longer than the leaves; divisions of the calyx lanceolate, obtuse; petals all very entire, green at the base, upper and lateral ones rarely sub-villous, marked with a few blue lines; flowers odorous; wet soils; height two to four inches.

V. *PRIMULIFOLIA*: stoloniferous, glabrous; leaves oblong, or oblong-ovate, sub-cordate, acutish, crenate, decurrent into the petiole, nerve sometimes sub-villous beneath; peduncle somewhat four-sided, longer than the leaves; divisions of the calyx lanceolate, obtuse; petals all very entire, green at the base, upper and lateral ones sometimes a little villous, marked with a few blue lines, in the upper one often

obscure. Var. *villosa*, (Georgia,) leaves very green, and, with the petioles, densely villous, becoming hoary; flowers odorous; wet soils.

V. *LANCEOLATA*: glabrous; leaves (sometimes with a few scattering hairs) lanceolate, narrow, elongated, gradually attenuated into the petioles at the base, obtusish, crenate; peduncles somewhat four-sided, reddish, of the length of the leaves; divisions of the calyx lanceolate, acute; petals all very entire, green at the base, lateral ones sometimes a little villous at the base, and, with the upper one, marked with a few blue lines; flowers odorous, small; wet soils; height three inches.

V. *ROTUNDIFOLIA*: glabrous; leaves thickish, appressed to the earth, broad-ovate or orbicular, cordate, crenate; nerves pubescent beneath; sinus closed; peduncle somewhat four-sided, as long as the leaves; divisions of the calyx oblong, obtuse; petals sometimes emarginate, upper one small, lateral ones somewhat bearded, and, with the upper one, marked with a few yellowish-brown lines; spur very short; woods; height one to three inches.

V. *CLANDESTINA*: glabrous, de-

cumbent; leaves somewhat succulent, very green, shining, appressed to the earth, broad-ovate, and ovate-oblong, obtuse, sometimes sub-orbicular, crenate; sinus often closed; peduncles somewhat four-sided; branches two to eight-flowered; bracts in pairs, small, at the base of each pedicel; flowers of a chocolate-brown; concealed under the dead leaves of trees.

V. PEDATA: glabrous; leaves sometimes ciliate, variously divided, very often pedately nine-parted; divisions linear and obtusely lanceolate, generally three-lobed at the apex, often simply lanceolate, with the apex five to seven-lobed; peduncle somewhat four-sided; divisions of the calyx lanceolate, acute-ciliate, emarginate behind; petals all white at the base, veinless, very entire, very glabrous, naked, upper one truncate, and marked with a few very blue lines, sometimes obsolete. Var. *velutina* has the two lower petals of a very deep violet color, and appears like velvet. Var. *alba* has white flowers. Dry soils; height three or four inches.

V. CANADENSIS: glabrous; stem sub-simple, terete; stipules entire, membranaceous, oblong-subovate or lance-ovate; leaves alternate.

ovate, cordate, sub-acuminate, dentate; peduncle somewhat four-sided; bracts small, subulate; flowers regular; divisions of the calyx subulate, acute, very entire behind; petals white, all very entire, veiny, becoming yellow at the base, lower ones pale-violet, upper one broad, expanding, glabrous, naked, lateral ones bearded, and, with the upper one, marked with a few blue lines; stigma short, pubescent, scarcely beaked; spur very short; flowers odorous; stem often two feet long, flowering through the summer; moist woods.

V. ROSTRATA: glabrous; stems many, ascending, terete; leaves orbicular and ovate, cordate, crenate-dentate, sometimes with a few scattering hairs, younger ones cucullate; petioles much longer than the leaves; stipules linear, acuminate, furnished with elongated linear teeth; peduncle filiform, somewhat four-sided, slender, axillary, very long; bracts minute, subulate; divisions of the calyx lanceolate, acute, entire behind; petals all very entire, veinless, naked, beardless, upper and lateral ones marked with a few blue lines; spur straight, elongated, linear, compressed, obtuse, double the length of the petals; root

woody, perpendicular and fibrous; moist woods; height six to ten inches.

V. MUHLENBERGIA'NA: glabrous; stem terete, weak, sub-prostrate; leaves reniform, roundish, cordate, upper ones ovate, crenate, often purplish beneath, younger ones cucullate; petioles longer than the leaves; stipules large, lanceolate, serrate-ciliate, sub-pinnate; peduncles somewhat four-sided, axillary, longer than the leaves; bracts minute, subulate; divisions of the calyx linear, acute, sub-ciliate; petals all very entire, veinless, upper one naked, glabrous, lateral ones bearded, and, with the upper one, marked with a few blue lines; spur porrected, compressed, very obtuse; stigma ciliate behind; beak ascending; height three to six inches.

V. STRIATA: glabrous; stem oblique, branching, angular; leaves roundish and ovate, sub-acuminate, crenate-dentate, sometimes sub-pubescent; petioles long; stipules large, oblong-lanceolate, dentate-ciliate; peduncles four-sided, longer than the leaves; bracts largish, linear; divisions of the calyx lanceolate, acuminate, ciliate, emarginate behind; petals all very entire, upper one marked, with a few blue

lines, naked, glabrous, rarely a little villose, lateral ones bearded, lower ones sometimes a very little villose; spur sub-porrected; stigma pubescent behind; height six to eighteen inches.

V. PUBESCENS: villose-pubescent; stem simple, erect, terete, leafless below; leaves broad-ovate, cordate, dentate; petioles short; stipules ovate, large, dentate; peduncles four-sided, shorter than the leaves; bracts subulate, minute; divisions of the calyx lanceolate; petals all very entire, veinless, upper one naked, glabrous, lateral ones bearded, and, with the upper one, marked with a few blue lines, lower ones often becoming reddish outside; spur short, gibbose, acutish; stigma pubescent, scarcely beaked, varies in pubescence; leaves are even found glabrous; the capsules are also glabrous or woolly.

V. HASTATA: glabrous; stem simple, erect, terete; leaves ovate, dilated, acuminate, cordate, dentate, upper ones lance-ovate, hastate and deltoid; petioles short; stipules ovate, dentate; peduncles somewhat four-sided, shorter than the leaves; bracts very small, subulate; divisions of the calyx lance-linear, sub-dentate; petals all very entire,

veinless, upper ones naked, glabrous, lateral ones bearded, and, with the upper ones, marked with a few blue lines, lower one often becoming reddish outside; spur short, gibbous, acutish; stigma pubescent, scarcely beaked; capsule glabrous or pubescent on all sides; woods.

V. TENELLA: generally glabrous; root filiform; stem three-sided, angled, erect, simple, leafy; leaves dentate, radical ones round or spatulate, upper ones ovate or lanceolate, all sub-spatulate; petioles short; stipules very large, pinnatifid, palmate, intermediate lobe oblong, longer and broader, the rest linear-oblong, all obtuse, ciliate; peduncles four-sided, much longer than the leaves; divisions of the calyx lance-ovate, acuminate, ciliate, emarginate behind; petals expanded, white, stained with blue, yellow at the base, upper ones naked, glabrous, lateral ones bearded, and, with the upper ones, marked with a few blue lines; stigma sub-pubescent, scarcely beaked. This species and the V. rostrata are the only American violets that have fibrous roots; all the rest have their roots scaly.

## Z.

ZEA. Indian Corn. 21—2.

## Z. MAYS, Common Indian Corn.

Of this well-known corn there are numerous varieties. Its uses are known to every one. In New England it is the most important object, perhaps, of agriculture. It has been supposed, on what grounds nobody knows, that it came originally from Turkey, and by the old botanists it was called *Turkey Wheat*. If, instead of his muffin, old Gerard had ever finished his breakfast with a *bannock* or *Johnny cake*, brought up smoking from the hearth, or had he but seen a rich yellow *hasty pudding*, fretting, puffing and sputtering over the fire, he never would have said, "Turky wheat doth nourish far lesse than either wheat, rie, barley, or otes. The bread which is made thereof is meanely white, without bran; it is hard and dry as Bisket is, and hath in it no clamminesse at all; for which cause it is of hard digestion, and yeeldeth to the body little or no nourishment. Wee have as yet no certaine prooffe or experience concerning the vertues of this kinde of Corne; although the barbarous Indians, which know no better, are constrained to make a vertue of necessity, and thinke it a good foode; whereas we may easily iudge, that it nourisheth but little, and is of

hard and euill digestion, a more conuenient foode for swine than for man." And then the ears boiled when green—I think it was Cobbett who, having succeeded in cultivating some of this corn in England, presented a few boiling ears to a friend, and calling on him at dinner time, found him eating an ear from end to end, cob and all. "Very good, friend Cobbett,—right sort of stuff this you sent me—rather coarse eating, though."

**ZOSTERA.** Sea Wrack-grass.  
1—2. Calyx none, excepting the base of the leaf, inclosing the spike-stalk, and splitting lengthwise; co-

rolla none; spadix linear, bearing numerous flowers; anther oblong, one-celled, attached laterally; germs egg-shaped, sessile; style simple, curved outwards; stigmas two, thread-shaped, curved; drupe cylindrical; nut one, elliptical, striated; kernel of the same form.

*Z. MARINA*, *Eel-grass*, *Sea-wrack*, *Sea-grass*: leaves entire, obscurely three-ribbed, linear; stem slightly compressed; leaves very long, grass-green, obtuse; spadix pale green; perennial; flowers in August; grows on sandy shallows and banks in the sea, and is thrown up abundantly after storms.







## GLOSSARY OF TERMS.

As the Glossary is intended to answer the purpose of an index to the *Introduction*, the figure at the end of a definition refers to the page of that part of the volume.

- Aberrant*, deviating from the natural or usual way.
- Abortive*, producing no fruit.
- Abort*, with the extremity cut off, as it were, by a transverse line. 38.
- Abruptly pinnate*, without a terminal leaflet or tendril. 47.
- Acerose*, stiff, linear and sharp, as in the leaves of the pines. 42.
- Acinaciform*, scimitar-shaped. 41.
- Acicular*, needle-shaped.
- Acotyledonous*, having no cotyledons or seed-lobes, as ferns. 21.
- Acotyledonous plants*. 21.
- Aculeate*, prickly. 53.
- Acute*, ending in a sharp point.
- Acuminate*, taper-pointed.
- Adnate*, growing to; affixed laterally.
- Adpressed*, seated upon and pressed close to the stem. 47.
- Agglomerated*, bunched; crowded together.
- Aggregate flowers*, when several flowers, generally stalked, and with separated anthers, are inclosed in a common calyx.
- Aigrette*, seed-down.
- Alated*, winged. 55.
- Alburnum*, perfect wood. 32.
- Alternate*, coming off one by one, in different directions. 38, 47.
- Alternately pinnate*, with alternate leaflets.
- Ament* or *calkin*, a collection of small scales, serving for calyxes, on the side of a slender stalk; as in *Juglans cinerea*.
- Amplexicaul*, stem-clasping. 38, 47.
- Androgynous*, producing both sexes from the same root or the same flower.
- Anfractuose*, full of turnings and winding passages.
- Angiospermia*, an order of plants, having several seeds enclosed in an undivided pericarpium. 79.
- Angular*, composed of or furnished with angles.
- Angulo-dentate*, angularly toothed.
- Annual*, living but one year, during which it produces flowers and seed.
- Anterior*, growing in front of something else.
- Anther*, that part of a stamen which contains the pollen. 56.
- Antheriferous*, bearing anthers.
- Antheroid*, resembling anthers.
- Apetalous*, without petals. 55.
- Apex*, end, tip, or sharp extremity.
- Aphyllous*, without leaves.
- Apiculus*, a small point.
- Apple*, a fleshy fruit, containing a capsule.
- Appressed*, pressed against or close to.
- Approximated*, near together.
- Apterus*, without wings.
- Aquatic*, growing in or belonging to water.
- Arachnoid*, covered with hairs woven together forming a mesh.
- Arboreous*, like a tree.
- Arborescent*, approaching to the size of a tree.
- Arcuate*, curved or bent like a bow.
- Aridity*, dryness.
- Arillus*, a process of the placenta adhering to the hilum of seeds and sometimes enveloping them.
- Aristate*, awned; ending in a bristle.

*Armature of plants.* 53.  
*Armed*, furnished with thorns or prickles.  
 46.  
*Arrow-shaped*, triangular, hollowed at the base.  
*Articulated stem or leaf*, formed into distinct parts, united by portions of smaller diameter. 38.  
*Ascending*, having an oblique direction upwards.  
*Assurgent*, rising upwards.  
*Attenuated*, gradually diminished or tapering.  
*Auriculate*, furnished with lateral projections, or leaflets, resembling ears. 40.  
*Axil-shaped*, long, cylindrical at the base, and tapering to a point.  
*Axon*, an elongated, stiff, acute body upon the flowers of grasses.  
*Axil*, the upper angle formed by the union of a leaf with the stem.  
*Axillar or axillary*, growing in or from the axil. 39.

## B.

*Baccate*, berried; having a fleshy coat or covering. 59.  
*Banner*, the upper and commonly largest petal of a papilionaceous flower.  
*Barbed or bearded*, having a tuft of long hairs.  
*Bark*, coat or covering of plants. 33.  
*Barren flowers*, having stamens but not pistils, and therefore not producing fruit.  
*Bell-shaped*, of the form of a bell, with the margin turned outwards.  
*Berry*, a juicy fruit containing seeds imbedded in its pulp.  
*Bi*, prefixed to another word, signifies two, as bi-partite, two-parted.  
*Bicuspidate*, with two sharp, straight points.  
*Bidentate*, double-toothed; having two teeth.  
*Biennial*, living two years, in the second of which the flower and fruit are produced.  
*Biserial*, placed in two rows.  
*Bifid*, two-cleft; cut nearly into two parts.  
 43.  
*Bigeminate*, twice paired. 47.

*Biglandular*, double-glanded.  
*Bilabiate*, having two lips.  
*Bilobed*, having two lobes.  
*Binate leaf*, when two leaflets rest upon a common stalk. 47.  
*Biptennate*, twice pinnate. 38.  
*Biscutate*, resembling two bucklers placed side by side.  
*Biternate*, twice ternate. 38.  
*Bi-tri-crenate*, crenate twice or thrice.  
*Bi-tri-pinnatifid*, pinnatifid twice or thrice over.  
*Bi-tri-ternate*, growing in threes twice or thrice over.  
*Bisulved*, two-valved.  
*Blistered*, having the surface wrinkled so as to appear as if covered with blisters. 46.  
*Botany*, the science of plants. 9.  
*Bractea*, a leafy appendage to the flower or its stalk. 51.  
*Branches*, divisions of the stem. 36.  
*Bristly*, covered with short stiff hairs.  
*Bristle-pointed*, terminated by a bristle or bristly point.  
*Bristle-shaped*, long, cylindrical at the base, tapering and very slender.  
*Bristles*, short, stiff hairs.  
*Border*, the expanded part of the petal.  
*Bulbous root*, with an enlarged globular part, and numerous fibres.  
*Bundle*, flower-stalks of equal length, growing close together.

## C.

*Cæspitose*, growing in little tufts.  
*Caducous calyx*, falling off before the corolla.  
*Calcarate*, spurred, or spur-shaped. 55.  
*Calceiform*, shaped like a little shoe.  
*Calyx*, the outer, generally green covering of a flower. 54.  
*Calyxiform*, shaped like a calyx.  
*Cambium*, the first formation of wood. 32.  
*Campanulate*, bell-shaped. 55.  
*Canaliculate*, channelled or furrowed.  
*Cancellate*, resembling lattice-work.  
*Canescent*, hoary, whitish.  
*Capillary*, hair-like.  
*Capitate*, shaped like a head, or bearing a head.

- Capule**, a dry seed-vessel, generally of a membranous texture. 59.
- Carina**, the keel of a papilionaceous flower. 55.
- Carinate**, keel-shaped. 43.
- Carnose**, fleshy.
- Carpella**, the small parts out of which compound fruits are formed.
- Cartilaginous**, thick and tough. 45.
- Caryophyllaceous**, like a pink. 55.
- Catkin**, a long simple flower-stalk thickly covered with scales and flowers.
- Caudate**, tailed; being like a tail.
- Caudex**, the trunk or stem.
- Cauline**, growing on the stem. 38, 39.
- Cellular**, made up of little cells or cavities. 19.
- Ceraceous**, wax-like.
- Cernuous**, nodding, drooping or pendulous.
- Chaffy**, covered with membranous scales.
- Chaff-scale**, the calyx of grasses and allied plants.
- Channelled** leaves or stalks, with a longitudinal groove.
- Ciliated**, fringed with hairs. 46.
- Cinereous**, ash-colored.
- Circinately**, curved round like a sharp hook.
- Cirrhiferous**, bearing tendrils.
- Cirrhose** or **cirrhous**, tendrilled. 38, 53.
- Cirrus**, a tendril. 53.
- Clammy**, covered with glutinous juice.
- Clasping**, surrounding the stem partly or quite with the base of the leaf.
- Clathrate**, latticed; divided like lattice-work.
- Clavate**, club-shaped.
- Claw**, the narrow portion of a petal.
- Cleft**, deeply divided.
- Climbing**, ascending on other bodies.
- Clinging**, holding fast to another body for support.
- Close-pressed**, lying flat.
- Cluster**, numerous flowers, each on a stalk, arranged along a common stalk.
- Clustered leaves**, crowded together.
- Clypeate**, shaped like a Roman buckler.
- Coated bulbous root**, composed of layers. 31.
- Cocci**, grain, seeds.
- Coccum**, a grain or seed.
- Cochleate**, resembling the shell of a snail.
- Colored calyx**, of any other color than green. 46.
- Common calyx**, containing several flowers with united anthers.
- Common corolla**, consisting of several flowers with united anthers, contained in a common calyx.
- Common or general umbel**, the first divisions of an umbel.
- Common involucre**, at the base of a general umbel.
- Comose**, a term used to express a kind of inflorescence which is terminated by sterile bractem.
- Complete flower**, furnished with both calyx and corolla.
- Compound flower**, when a number of flowers with united anthers grow in a common calyx.
- Compound leaf**, consisting of several pieces, connected by insertion into a common stalk. 47.
- Compressed**, flattened laterally.
- Conduplicate**, folded so that the two edges lie together.
- Cone**, a catkin hardened and enlarged.
- Conserted**, applied to leaves, placed thickly so as to hide the stem. 47.
- Conglomerate**, crowded together.
- Conical receptacle**, elevated and coming to a point.
- Conjugate**, joined in pairs.
- Conjugate leaf**, with two leaflets.
- Connate**, opposite, with the bases united or growing into one. 38, 47.
- Convivent**, converging.
- Contorted**, twisted; bent from a common position.
- Convolute**, rolled together.
- Cordate**, heart-shaped, with the stalk inserted in the largest end. 39.
- Coriaceous**, resembling leather; thick and tough.
- Corneous**, horny; having a consistence like horn.
- Corniculate**, horn-shaped.
- Corolla**, the envelope of colored and delicate leaves of a flower. 55.
- Corona**, a crown-like cun.
- Corrugated**, wrinkled or sarvelled.
- Cortical**, belonging to the bark.
- Corymb**, an erect cluster, the partial stalks

- of which are gradually longer as they stand lower on the common stalk.
- Costate*, ribbed. 37.
- Cotyledons*, the two portions of a seed which at germination change into leaves. 20.
- Cover*, a membranous covering for the sori of ferns.
- Creeping root*, one with a subterranean stem, sending off fibres at intervals.
- Creeping stem*, running along the ground, and sending down roots at intervals.
- Crenate*, scalloped; having sharp notches on the edge separated by round or obtuse dentures. 45.
- Crenulate*, finely or minutely crenate.
- Cribiform*, riddled with holes like a sieve.
- Crisp*, much curled or undulated at the margin. 44.
- Cruciform corolla*, of four petals, with long claws, standing opposite in pairs. 55.
- Crustaceous*, having a hard brittle shell.
- Cryptogamia*, the twenty-fourth class of the sexual system. 95.
- Cucullate*, hooded or cowlled; rolled or folded in. 43.
- Culm*, the stem of grasses, reeds, and similar plants.
- Cuneiform*, shaped like a wedge, with the stalk attached to its point. 43.
- Cup-shaped*, of the form of a bell, with the margin straight.
- Cupule*, the cup of an acorn, and of all amentaceous plants.
- Curled*, with the margin folded and more expanded than the disk.
- Cuspidate*, having a sharp, straight point.
- Cuticle*, the scarf-skin or epidermis.
- Cylindrical*, round and elongated. 44.
- Cyme*, a kind of umbel, the partial stalks of which are irregular.
- D.**
- Decagynous*, having ten styles. 75.
- Decandria*, the tenth class of the sexual system. 74.
- Decandrous*, having ten stamens.
- Deciduous leaves*, falling off every year.
- Deciduous calyx* or *corolla*, falling off before the fruit is perfected.
- Declinate*, tending downwards.
- Decomound*, twice compound; composed of compound parts.
- Decumbent stem*, lying on the ground at the base.
- Decurrent*, when the edges of a leaf run down the stem or stalk. 38.
- Decurrently pinnate*, when the leaflets run down the stalk. 38.
- Decursively pinnate*. 48.
- Decussated* or *decussating*, in pairs, alternately crossing. 36.
- Deflexed*, turned downwards.
- Dehiscent*, gaping.
- Deltoid*, shaped like the Greek  $\Delta$ . 42.
- Dentate*, toothed; edged with sharp projections separated by notches; larger than serrate. 45.
- Denticulate*, minutely toothed.
- Depressed*, flattened vertically.
- Depressed leaves*, root-leaves pressed close to the ground.
- Diadelphia*, the seventeenth class of the sexual system. 92.
- Diadelphous*, having the stamens united in two parcels or sets. 56.
- Diandria*, the second class of the sexual system. 65.
- Diandrous*, with two stamens.
- Dichotomous*, forked; dividing into two equal branches.
- Dicoccus*, having two cocci.
- Dicotyledonous*, having two cotyledons or seed-lobes.
- Didymous*, having two united. 56.
- Didynamia*, the fourteenth class of the sexual system. 79.
- Didynamous*, belonging to the class Didynamia, with two short and two long stamens and a ringent corolla.
- Diffuse*, scattered; widely spread.
- Digitate*, several leaflets resting on the top of a common stalk. 38, 40.
- Digynous*, having two styles. 64.
- Diaecia*, the twenty-second class of the sexual system. 90.
- Diaecious*, when stamiferous flowers grow on one plant, and pistilliferous flowers on another plant of the same species.
- Dipentagynia*, plants having from two to five pistils. 77.

*Discus*, disk.

*Disk*, the central florets of a compound flower. 57.

*Dissepiment*, the partition or internal wall of a capsule. 21, 60.

*Ditrichotomous*, divided in twos and threes.

*Ditrigynia*, plants having two to three pistils.

*Divaricate*, diverging so far as to turn backward.

*Divergent*, spreading; separating widely.

*Dodecagynia*, plants having twelve pistils. 76.

*Dodecandria*, the eleventh class of the sexual system. 75.

*Dodecandrous*, with twelve stamens.

*Dolabriform*, hatchet-shaped. 42.

*Dorsal*, on the back.

*Drooping*, inclining downward; more than nodding.

*Downy*, covered with soft fine hairs.

*Drupe*, a fleshy fruit, containing a nut. 59.

## E.

*Echinate*, beset with prickles; hedgehog-like.

*Egg-shaped*, longer than broad, the base broader than the end. When applied to the leaf, bractea, petal, etc., the term merely implies that these flat parts have the outline of an egg; but when applied to a seed or capsule, it means that they are truly of the form of an egg.

*Egret*, seed-down.

*Elliptical*, the length greater than the breadth, and both ends rounded. 41.

*Elongated*, exceeding a common or average length.

*Emarginate*, having a notch in the end.

*Embracing* the stem, leaves sessile and clasping the stem at their base.

*Emersed*, standing out of the water. 47.

*Enneandria*, the ninth class of the sexual system. 73.

*Enneandrous*, with nine stamens.

*Ensate* or *ensiform*, shaped like a sword with a straight blade. 41.

*Entire*, without division, or without teeth or notches on the edges. 44.

*Epidermis*, the outer skin of the bark.

*Equal*, all of the same length. 38.

*Equilant* leaves, disposed in two opposite rows, and embracing each other at the base.

*Erect*, rising perpendicularly.

*Eroded*, irregularly denticulated, appearing as if gnawed or bitten. 45.

*Even*, destitute of inequalities.

*Evergreen* leaves, remaining green during the winter.

*Exotic*, foreign.

*Exserted*, projecting or extending out of the flower or sheath.

## F.

*Falcate*, bent like a sickle.

*Farina*, the pollen.

*Farinaceous*, mealy.

*Fascicle*, a bundle.

*Fasciculate*, collected in bundles.

*Fastigate*, flat-topped.

*Fauces*, the jaws; the gaping part or orifice of a monopetalous flower.

*Faux*, throat of a corolla. 55.

*Fucose*, pitted or excavated like the cells of a honeycomb.

*Feathery seed-down*, consisting of hairs which are subdivided like the shaft of a feather.

*Fertile*, containing perfect pistils and yielding fruit.

*Fibrous root*, consisting entirely of fibres or radicles.

*Filament*, the stalk which supports the anther.

*Filiform*, thread-like, or very slender.

*Fimbriate*, finely divided at the edge like fringe.

*Flabelliform*, fan-shaped. 43.

*Fleshy*, thick and juicy.

*Flat receptacle*, perfectly even.

*Flexuous*, serpentine or zigzag.

*Floating leaves or stems*, lying flat on the surface of the water.

*Flocci*, little tufts like wool.

*Floral leaf*, an appendage to the flower or its stalk. 39.

*Floret*, a little flower; one in an aggregate or compound flower.

*Flosculous*, compound flowers, consisting

of many tubulose monopetalous florets.  
*Flower and fruit.* 54.  
*Flower-stalk,* a slender body which supports the flower.  
*Foliateous,* having the form of leaves.  
*Follicle,* a one-valved, one-celled capsule, opening lengthwise. 59.  
*Forked,* regularly and repeatedly dividing into two.  
*Four-ranked,* with leaves or branches spreading in four directions.  
*Fringed,* margined with a row of hairs.  
*Frond,* a leaf bearing the fructification.  
*Fructification,* the flower and fruit with their parts.  
*Frutescent,* becoming shrubby.  
*Fruticose,* shrubby.  
*Fugacious,* that which lasts but a short time.  
*Funicle,* the little stalk by which a seed is attached to the placenta.  
*Funnel-shaped,* tubular at bottom and gradually expanding at top.  
*Furcate,* forked.  
*Furrowed,* marked with parallel elevated and depressed lines.  
*Fusiform,* spindle-shaped; when a root is large at top and tapers downward, as in the carrot and radish.

## G.

*Galeate,* helmeted. The upper lip of a ringent corolla is the galea of that corolla. 55.  
*Gaping corolla,* an irregular corolla, with two lips and an open throat.  
*Geminate,* doubled.  
*Generic,* belonging to a genus.  
*Geniculate straw,* with the joints enlarged and bent like a knee.  
*Genus,* a family of plants agreeing in their flower and fruit.  
*Germen,* the undermost part of the pistil.  
*Germination,* the first act of vegetation in a seed.  
*Gibbous,* protuberant.  
*Glabrous,* smooth, as it regards hairiness or pubescence.  
*Glabrate,* shaped like a short straight sword.

*Gland,* a small roundish appendage, apparently performing some function of secretion or excretion. 53.  
*Glandular leaf,* a leaf with its margin studded with little glands or processes. 48.  
*Glandular pubescence,* hairs tipped with little heads or glands. 53.  
*Glaucouscent or glaucine,* having something of a bluish hoary appearance.  
*Glaucous,* covered with a pale greenish-blue mealiness.  
*Globose,* spherical; roundish.  
*Glochidate,* having hairs, the ends of which are split and hooked back, so that the hook is double. 54.  
*Glomerate,* gathered into a round heap or head.  
*Glottis,* the throat.  
*Glume,* the scales, valves, or chaff, which make the calyx and corolla of grasses.  
*Glumaceous,* having flowers like those of grasses.  
*Gnawed,* irregularly notched at the margin.  
*Granular,* covered as if with grains.  
*Granulated root,* consisting of small bulbs or scales.  
*Grooved,* marked with parallel deep lines.  
*Grumous,* contracted at intervals into knots.  
*Gymnospermia,* an order of plants, having the pericarpium divided into four lobes resembling naked seeds. 79.  
*Gymandria,* the twentieth class of the sexual system. 87.  
*Gymandrous,* having the stamens growing on the pistils.  
*Gyrore,* turned round like a crook.

## H.

*Habit,* features or general appearance of a plant.  
*Hair-shaped,* long, cylindrical, and slender.  
*Hairs,* slender bodies of various degrees of fineness, covering the surface of plants.  
*Hairy,* covered with long, soft, straight hairs.  
*Halberd-shaped,* triangular, hollowed out

at the base and sides, with a projecting part on each side. 41.

*Hastate*, formed like the head of a halbert; halbert-shaped. 41.

*Haulm*, dead stems of herbs.

*Head*, flowers arranged sessile in a globular form.

*Heart-shaped*, egg-shaped with the base hollowed out.

*Helmet*, the concave upper lip of a labiate flower.

*Hemispherical*, of the form of a half-sphere.

*Heptandria*, the seventh class of the sexual system. 70.

*Heptandrous*, having seven stamens.

*Herbaceous*, soft, in opposition to woody.

*Hermaphrodite*, consisting of two sexes.

*Hexagonal*, six-sided.

*Hexandria*, the sixth class of the sexual system. 69.

*Hexagynia*, plants having six pistils. 73.

*Hexandrous*, with six stamens.

*Hilum*, the scar or mark left on a seed by the funicle. 21.

*Hirsute*, rough with hairs. 54.

*Hispid*, bristly.

*Hoary*, covered with close, extremely fine, white hairs.

*Hollow stem or leaves*, cylindrical, with an internal cavity.

*Honey-pore*, the pore in flowers which secretes honey.

*Hooded*, curved or hollowed at the end into the form of a hood.

*Horizontal* branches or leaves, standing off at right angles.

*Horn*. Any long subulate process in a flower is called a horn.

*Husk*, the corolla of grasses.

*Hybernacula*, the scales or winter covering of buds. 36.

*Hybrid*, partaking the nature of two species.

*Hygrometrical*, that which indicates the approach of moisture.

*Hypocrateriform*, salver-shaped; with a tube abruptly expanded into a flat border. 53.

*Hypogynous*, situated below the ovary.

*Hypophyllous*, under the leaf.

## I.

*Icosandria*, the twelfth class of the sexual system. 76.

*Icosandrous*, having about twenty stamens growing on the calyx, and not on the receptacle; belonging to the class Icosandria.

*Imbricated leaves* or other organs, one lying over the other.

*Immersed*, under water.

*Incised*, cut; separated by incisions.

*Incomplete flower*, when the corolla is wanting.

*Incrassated*, becoming thicker by degrees.

*Incumbent anther*, lying across the top of the filament.

*Incurved*, bending inwards.

*Indehiscent*, not gaping.

*Indigenous*, native; growing originally in a country.

*Indurated*, hardened.

*Inferior*, lowermost. Used to express the relative situation of the calyx and germ. An inferior flower is one in which the calyx and corolla are below the germ.

*Inflated*, having the appearance of being blown out.

*Inflexed*, bending inwards.

*Inflexed*, bent inwards.

*Inflorescence*, the manner in which the flowers are arranged.

*Infundibuliform*, funnel-shaped. 55.

*Internodes*, the spaces between the joints of plants.

*Interruptedly pinnate*, with smaller leaflets between the larger. 38, 47.

*Inverse*, inverted.

*Inversely egg-shaped* or heart-shaped, with the broad end outermost.

*Involucre*, a kind of bractea, consisting of several leaves, at a distance from the flower. 61.

*Involute*, rolled inwards at the margin.

*Irregular corolla*, not uniform in its general form.

## J.

*Jagged*, irregularly cut at the margin.

*Jointed*, composed of distinct pieces united by intermediate parts.

*Jointedly pinnate.* 49.

*Juliiform*, formed like an ament or catkin.

## K.

*Keel* of a papilionaceous corolla, the lower boat-shaped piece.

*Keeled leaves* or other parts, with a longitudinal prominence at the back.

*Kernel*, the seed of a nut.

*Kidney-shaped*, roundish, with the base hollowed out.

*Knead straw*, with the joints enlarged and bent like a knee.

*Knobbed stigma*, of a somewhat globular form.

*Knotty*, leaving knots at intervals.

## L.

*Labellum*, the front segment of some flowers.

*Labiate*, having an upper and lower lip, as in flowers of the class Didynamia. 55.

*Lacinia*, segments of any thing.

*Laciniate*, cut, torn, and jagged.

*Lactescent*, yielding a white or milky juice when wounded.

*Laevis*, smoothed.

*Lamellated*, divided by plates internally.

*Lamina*, the expanded part of a petal.

*Lanceolate*, spear-shaped; narrow, with both ends acute. 41.

*Lance-shaped*, oblong and narrow, tapering toward each end.

*Lateral anther*, attached to the side of the filament.

*Lateral leaves*, from the sides of the stem or branches.

*Lax*, loose; not compact.

*Leaflet*, a partial leaf; a constituent of a compound leaf.

*Leaf-stalk*, the stalk of a leaf.

*Leathery*, thin but tough.

*Legume*, a dry elongated seed-vessel, formed of two oblong valves, without a longitudinal part. 59.

*Lenticular*, shaped like a lens.

*Leprous*, covered with spots.

*Liber*, the inner bark of plants. 33.

*Lid*, the calyx which falls off from the flower in a single piece.

*Ligneous*, woody.

*Ligulate*, strap-shaped.

*Ligule*, the stipule of grasses.

*Lilaceous*, resembling the lily. 55.

*Limb*, the border or spreading part of a monopetalous corolla. 55.

*Linear*, flat, very narrow, with the edges parallel. 44.

*Linguiform* or *lingulate*, tongue-shaped. 39.

*Lip*, the upper or under side of the mouth of a labiate corolla or nectary.

*Lobed*, divided into segments with rounded margins.

*Lobelets*, small lobes.

*Locuments*, partitions or cells of a seed-vessel.

*Locular*. A fruit is called uni-locular when it contains but one cell, bi-locular with two, tri-locular with three, and so on.

*Loment*, a kind of legume falling in pieces when ripe. 59.

*Lorate*, shaped like a thong or strap.

*Lunate* or *lunulate*, crescent-shaped. 43.

*Lymphatic*, of or belonging to lymph or sap.

*Lyrate*, lyre-shaped. 42.

*Lyre-shaped*, pinnatifid, with the terminal segment rounded and larger.

## M.

*Marginal*, relating to the margin.

*Matrix*, a place where any thing is generated or formed.

*Medulla*, the pith of a plant.

*Medullary*, relating to the pith of plants.

*Melliferous*, honey-bearing.

*Membranous*, very thin, dry, and easily torn.

*Mesher*, the openings in any tissue.

*Midrib*, the large vein which passes from the petiole to the apex of a leaf.

*Miliary*, granulate; resembling many seeds.

*Mitiform*, formed like a mitre.

*Monadelphia*, the sixteenth class of the sexual system. 81.

*Monadelphous*, having the stamens united into a tube at the base. 56.

*Monandria*, the first class of the sexual system. 64.



*Monandrous*, having one stamen. 64.

*Moniliiform*, with alternate swellings and contractions resembling a string of beads.

*Monocotyledone*, having one seed-leaf.

*Monocia*, the twenty-first class of the sexual system. 88.

*Monocious*, when stamiferous flowers and pistilliferous flowers exist on the same plant.

*Monogynous*, with one style. 64.

*Monopetalous*, having but one petal, that is, the corolla of one piece. 55.

*Monophyllous*, consisting of one leaf or piece.

*Monosepalous*, having one sepal or division of the calyx.

*Mottled*, marked with blotches of color of unequal intensity passing insensibly into each other.

*Mucilage*, a turbid slimy fluid.

*Mucronate*, having a small point projecting from an obtuse end.

*Multipartite*, much divided.

*Muricate*, covered with sharp spines or prickles.

## N.

*Naked flower*, destitute of a calyx.

*Naked stem or leaf*, without hairs.

*Narcotic*, producing sleep or torpor.

*Natant*, floating. 47.

*Navicular*, boat-shaped.

*Nectary*, a part of the flower which contains or secretes honey. 55.

*Needle-shaped leaves*, linear and evergreen.

*Nerves*, the strong veins of leaves or flowers.

*Nerved*, marked with nerves. 46.

*Neutral flowers*, destitute of both stamens and pistils.

*Nodding*, inclining to one side; partly drooping.

*Nodi*, the articulations of plants; the joints.

*Nodules*, small hard knots.

*Notched leaf or petal*, ending with a small notch.

*Nut*, a seed covered with a hard shell, which does not burst.

## O.

*Ob* is used in composition to indicate that a thing is inverted, as obovate is inversely ovate, &c.

*Oboordate*, heart-shaped with the point inward or downward.

*Oblong*, when the length is three or four times greater than the breadth, and the end rounded.

*Obovate*, ovate, but inverted.

*Obsolete*, obscurely developed.

*Obtuse*, rounded at the end.

*Ocandria*, the eighth class of the sexual system. 71.

*Ocandrous*, having eight stamens.

*Octogynous*, having eight styles.

*Official*, any thing that is, or has been, used in shops.

*Oleaginous*, having the qualities of oil.

*Oleraceous*, esculent, eatable.

*Opercular*, covered with a lid.

*Operculum*, a lid.

*Opposite leaves*, or other parts, coming off on opposite sides at the same place.

*Oppositely pinnate leaf*, with opposite leaflets.

*Orbicular*, round and flat. 43.

*Oval*, the length greater than the breadth, and both ends alike rounded. 41.

*Ovarium or ovary*, the part of a flower in which the young seeds are contained.

*Ovate*, egg-shaped; oval, with the lower end largest. 41.

## P.

*Palae*, chaff-scales.

*Palate*, a large obtuse projection which closes the throat of a personate flower.

*Paleaceous*, abounding with chaffy scales.

*Palmate leaf*, having several oblong segments extending to the middle. 40.

*Panduriform*, fiddle-shaped.

*Panicle*, when the flowers are in a kind of loose, subdivided cluster.

*Panicked stem*, with irregular branches which are themselves irregularly divided, the last divisions bearing flowers.

- Papilionaceous*, having an irregular corolla like the pea blossom. 55.
- Papille*, small, soft prominences.
- Papillous*, covered with small soft prominences.
- Pappus*, seed-down.
- Parasitic*, growing on another plant and drawing nourishment from it.
- Parical*, attached to the sides of an ovary instead of its axis.
- Partial involucre*, at the base of a partial umbel.
- Partial umbel*, the secondary division of an umbel.
- Partite*, parted.
- Pectinate*, pinnatifid, with the segments very narrow. 43.
- Pedate leaf*, a ternate leaf, having its lateral leaflets divided into several others. 40.
- Pedicel*, the ultimate branch of a peduncle; a little stalk.
- Peduncle*, a slender body by which the flower is connected with the stem or branch.
- Pellicle*, a thin skin.
- Pellucid*, bright, transparent.
- Peltate leaf*, when the stalk is inserted into the middle. 41.
- Pendulous*, hanging.
- Pentagonal*, five-angled.
- Pentagynous*, having five styles. 69.
- Pentandria*, the fifth class of the sexual system. 68.
- Pentandrous*, having five stamens.
- Pentapetalous*, having five petals.
- Perennial*, lasting more than two years.
- Perfect flower*, one which possesses stamens and pistils, and produces fruit.
- Perfoliate*, when the stem, as it were, runs through a leaf.
- Perforate*, with small holes.
- Perianth*, a calyx contiguous to the corolla, or other internal parts of the flower.
- Pericarp*, the seed-vessel.
- Perigynous*, inserted into the calyx.
- Permanent leaves*, remaining unaltered during winter.
- Persistent calyx or corolla*, remaining until the fruit is ripe.
- Personate corolla*, irregular, with two lips, and a closed throat. 55.
- Pervious*, having a passage through which any thing can be transmitted.
- Petaloid*, like a petal.
- Petals*, the distinct pieces of a corolla.
- Petiolate*, having footstalks.
- Petiole*, the stalk which supports a leaf. 36.
- Pileus*, the cup of a mushroom.
- Piliferous*, bearing hairs.
- Pilose*, slightly hairy.
- Pinnate*, when several leaflets proceed from a common stalk. 36.
- Pinnatifid*, cut transversely into several oblong segments.
- Pisiform*, formed like pease.
- Pistillum or pistil*, a constituent part of a flower, including the germ, style, and stigma. In a regular flower it forms the central part. 57.
- Pistillate*, having pistils, but no stamens.
- Pith*, medulla occupying the centre of a stem or shoot. 32.
- Pithy*, having the central part filled with pith.
- Placenta*, fleshy receptacle. 60.
- Plaited*, folded so as to present alternately projecting and retiring angles. 45.
- Plane*, flat.
- Plicate*, plaited.
- Plumose*, feathery; feather-like.
- Plumula*, the young leaves in the embryo.
- Plurilocular*, having many cells.
- Pod*, a long dry seed-vessel of two valves, separating by a longitudinal partition, to the edges of which the seeds are alternately attached.
- Polished*, smooth and reflecting light.
- Pollen*, the dust or minute globules contained in the anther.
- Polyadelphia*, the eighteenth class of the sexual system. 84.
- Polyadelphous*, belonging to the class Polyadelphia, in which the stamens are united into several parcels. 56.
- Polyandria*, the thirteenth class of the sexual system. 78.
- Polyandrous*, having many disconnected stamens inserted into the receptacle.
- Polycotyledonous*, having seeds with more than two cotyledons.
- Polygamia*, the twenty-third class of the sexual system. 94.

*Polygamous*, having some flowers which are perfect, and others which have stamens only, or pistils only.

*Polygynous*, having many styles. 60.

*Polymorphous*, changeable; assuming a variety of forms.

*Polypetalous*, consisting of several distinct pieces or petals. 55.

*Polyphyllous*, having many leaves.

*Polyperinous*, having many seeds.

*Pome*, an apple. 59.

*Pores*, small cavities or holes.

*Pouch*, a little sack at the base of some petals and sepals.

*Precocity*, ripe before the usual time.

*Premorse*, bitten off; the same as abrupt.

*Preserving plants*. 102.

*Prickle*, an acute appendage arising from the bark.

*Prickly*, covered with prickles.

*Prismatic*, formed as a prism.

*Processes*, protrusions.

*Procumbent*, lying on the ground.

*Proliferous*, forming abundance of young about the roots.

*Propendent*, hanging forward and downward.

*Prurient*, stinging.

*Pubescent*, hairy or downy. 54.

*Pulvinate*, cushion-shaped.

*Punctate*, appearing as if pricked full of small holes or dots. 46.

*Pustular or pustulate*, covered with glandular excrescences.

*Pustules*, pimples or blisters.

*Putamen*, nut-shell.

*Pyriform*, pear-shaped.

## Q.

*Quadrangular*, flat and four-cornered.

*Quadrifarious*, arranged in four rows or ranks.

*Quadrifid*, divided four times. 43.

*Quadriglandular*, having four glands.

*Quaternary*, succeeding by fours.

*Quaternate-pinnate*, having pinnæ arranged in fours.

*Quinate* leaf, compound with five leaflets.

*Quinquangular*, flat with five corners.

*Quinquelfid*, divided into five.

*Quintuple*, five times multiplied.

## R.

*Raceme*, numerous flowers, each on a stalk, arranged along a common stalk.

*Racemose*, flowering in racemes.

*Rachis*, the common stalk to which the florets and spikelets of grasses are attached.

*Radiating fissure*, having the marginal florets long and spreading.

*Radical leaves*, growing from the root. 38.

*Radicule or radicle*, that end of the embryo which is opposite to the cotyledons.

*Radius*, the ray of compound flowers.

*Ramose*, branchy.

*Ramuli*, twigs or small branches.

*Ray*, the marginal elongated florets of a compound flower.

*Receptacle*, the point at which all the parts of a flower meet. 60.

*Reclinate leaves*, inclining downwards.

*Recurved*, curved backwards.

*Reflected*, bent backwards.

*Regular corolla*, uniform in its general figure.

*Remote leaves, scales, &c.*, widely separated.

*Reniform*, kidney-shaped; heart-shaped without the point. 39.

*Repand*, slightly wavy or serpentine at the edge. 44.

*Replicate*, folded back.

*Resupinate*, inverted in position.

*Reticulated*, resembling a net.

*Retuse leaf or petal*, ending in a broad shallow notch. 43.

*Revolute*, rolled backward or outward.

*Rhombic or rhomboid*, diamond-shaped. 44.

*Ribbed leaf*, when the vessels extend in undivided lines. 46.

*Ribs*, elevated lines.

*Rigid*, stiff.

*Ringent corolla*, the limb divided into two parts, leaving an open throat. 55.

*Root*. 22.

*Rosaceous corolla*, of five equal roundish petals. 55.

*Rostrate*, furnished with a beak.

*Rotate*, wheel-shaped; flat without a tube. 55.

*Rough*, covered with hairs.  
*Roundish* leaves or petals, when the length and breadth are nearly equal.  
*Rudiment*, an imperfectly developed organ.  
*Rugose*, wrinkled.  
*Runcinate*, having large teeth pointing backward. 46.  
*Runners*, procumbent shoots which root at their extremities.

## S.

*Sagittate*, arrow-shaped; like the head of an arrow. 41.  
*Salver-shaped* corolla, with a long cylindrical tube and expanded limb.  
*Samaras*, a winged pericarp not opening by valves. 59.  
*Sarmentose*, producing sarmenta or runners.  
*Scabrous*, rough.  
*Scaly stem*, covered with scales. 54.  
*Scandent*, climbing.  
*Scope*, a flower-stalk arising from the root.  
*Scarious*, dry and membranous.  
*Scattered*, irregularly distributed.  
*Scattered leaves or scales*, irregularly distributed.  
*Scrotiform*, formed like a double bag.  
*Seeds*. 19.  
*Seed-down*, a bristly crown attached to the seed.  
*Segments*, the divisions of an organ.  
*Semi*, half.  
*Semicylindrical*, elongated, flat on one side, and round on the other.  
*Seminal*, belonging to the seed.  
*Sepals*, segments of the calyx. 54.  
*Septa*, partitions dividing the interior of fruit.  
*Serrate*, with sharp close teeth, pointing in one direction. 46.  
*Sessile*, placed immediately on the stem, without the intervention of a stalk. 36.  
*Setaceous*, bristle-like.  
*Setae*, bristles.  
*Setose*, bristly.  
*Sexual system*. 62.  
*Shaggy*, covered with very long soft hairs.  
*Sheath*, a membranous covering inclosing

the flower, and afterwards bursting longitudinally.  
*Sheath of the leaf*, the lower part of the leaf of a grass, which incloses the straw.  
*Sheathing*, investing the stem with a sheath.  
*Shining*, reflecting light strongly.  
*Siliqua*, a long taper pod. 59.  
*Simple*, undivided, or consisting of one.  
*Simple leaf*, consisting of one piece.  
*Simple flower*, when a single flower is contained in the calyx.  
*Simple seed-down*, consisting of undivided hairs.  
*Sinus*, a large, rounded indentation or cavity. 44.  
*Smooth*, destitute of hairs.  
*Solid*, not hollow.  
*Solitary flower*, one only in the same place, or on the stem.  
*Sort*, masses or groups of capsules, arranged on the back of the frond in ferns.  
*Spadix*, an elongated receptacle of flowers, commonly proceeding from a spathe.  
*Spathe*, a sheathing calyx opening lengthwise on one side, and consisting of one or more valves. 52.  
*Spatulate*, circular at the end, and tapering towards the base. 43.  
*Spherical*, of the form of a sphere.  
*Spike*, numerous flowers arranged along a common stalk, without partial stalks.  
*Spiked flowers*, arranged in the form of a spike.  
*Spiked panicle*, a very close panicle resembling a spike.  
*Spikelet*, a term applied to grasses and other plants, which have many flowers arranged on a stalk within a common calyx.  
*Spindle-shaped root*, thick and fleshy, tapering downwards.  
*Spine*, an acute appendage, arising from the wood. 53.  
*Spongioles*, fibrous or the real roots of plants. 22.  
*Sporules*, the fruit of ferns. 21.  
*Spreading* branches or leaves, coming off at a moderately acute angle.

- Spur*, a horn-shaped production of the corolla.
- Spurious*, counterfeit.
- Squamose*, scaled. 31.
- Squarrose* or *equarrose*, ragged; having reflected or divergent scales.
- Stalk* or *scape*, a stem that supports flowers but not leaves.
- Stamens*, organs of the flower, consisting of a bag filled with powder, and generally supported on a stalk. 56.
- Staminate*, having stamens, but no pistils.
- Standard*, the upper petal of a papilionaceous corolla.
- Stellate*, like a star. 43.
- Stem* or *trunk*. 28.
- Stemless* plants, having no stem properly so called.
- Sterile*, barren.
- Stigma*, the top of the style. 60.
- Stimuli*, stinging hairs. 53.
- Stipitate*, having a short stalk.
- Stipule*, an appendage to the leaf. 50.
- Strap-shaped*, narrow and flat.
- Straw*, the stem of grasses, rushes, and allied plants.
- Striae*, small streaks, channels, or furrows.
- Striated* or *streaked*, marked with parallel lines.
- Strobilus*, a catkin hardened and enlarged. 59.
- Style*, a stalk supporting the stigma. 60.
- Sub*, prefixed to a word, signifies subordinate or somewhat.
- Subulate*, awl-shaped. 42.
- Subdivided stalk*, bearing several flowers.
- Submersed*, under water. 47.
- Succulent*, fleshy and filled with juice.
- Suffrutescent*, shrubby in a slight degree.
- Sulcate*, furrowed.
- Supernatant*, floating on the surface.
- Suture*, the line formed by the cohesion of two parts. 60.
- Sword-shaped* leaves, perpendicular, two-edged, and slightly convex on both surfaces.
- Syngenesious*, belonging to the nineteenth class of the sexual system.
- Syngenesia*, the nineteenth class of the sexual system. 84.
- Systematic botany*. 61.
- T.**
- Tail*, an elongated appendage to a seed.
- Tapering root*, thick and fleshy, tapering downwards.
- Tendril*, a thread-like organ, serving to attach plants to some support.
- Terete*, round, tapering to the end.
- Terminal*, at the end of the stem or branch. 38.
- Ternary*, consisting of threes.
- Ternate leaf*, when three leaflets rest upon a common stalk. 38, 47.
- Testa*, skin or integument of a seed.
- Tetrachotomous*, a stem that ramifies in fours.
- Tetradynamia*, the fifteenth class of the sexual system. 80.
- Tetradynamous*, having four long and two short stamens. 56.
- Tetragnynous*, with four pistils. 69.
- Tetrandria*, the fourth class of the sexual system. 67.
- Tetrandrous*, having four stamens.
- Tetrapetalous*, having four petals.
- Thorn*, an acute appendage, arising from the wood.
- Thread-shaped*, elongated, cylindrical and slender.
- Three-edged stem*, with three sharp angles.
- Thrice pinnate*, divided three times in a pinnate manner.
- Throat*, the orifice of a flower.
- Thyræ*, a kind of dense panicle, like that of the lilac.
- Thyræoid*, resembling a thyrae.
- Tomentose*, downy; covered with fine matted pubescence. 54.
- Toothed leaves* or other parts, having small protuberances on the margin.
- Torose*, uneven.
- Tortuose*, twisted.
- Torulose*, slightly torose.
- Tri*, prefixed to another word, signifies three, as tri-ternate, three times ternate.
- Triadelphous*, with the stamens united in three ranks. 56.
- Triandria*, the third class of the sexual system. 66.
- Triandrous*, with three stamens. 66.

*Triangular* leaf, flat, with three angles.  
*Trichotomous*, branches divided in threes.  
*Tricuspidate*, having three points.  
*Trifarious*, arranged in three ranks.  
*Trifid*, three-cleft. 43.  
*Trifoliate*, three-leaved. See *Ternate*.  
*Trigeminat*e, thrice paired.  
*Trigynous*, having three pistils. 66.  
*Trilobate*, three-lobed.  
*Trilocular*, having three cells.  
*Tripartite*, three-parted.  
*Tripetalous*, having three petals.  
*Tripinnate*, pinnate leaves in threes. 38.  
*Triquetrous*, having three sides or angles.  
*Trinervate*, thrice ternate. 38.  
*Tropical*, belonging to the torrid zone.  
*Truncate*, having a square termination as if cut off. 43.  
*Trunk*, the stem of a tree or shrub.  
*Tubercles*, the seed-vessels of ferns.  
*Tubercled*, rough with points.  
*Tuberculate*, covered with knobs or tubercles.  
*Tuberous*, bearing solid, fleshy, roundish roots, like the potato.  
*Tubular*, cylindrical and hollow.  
*Tufted leaves*, several springing from one point.  
*Tumid*, bulging out.  
*Tuniated*, coated with concentric layers; as the onion. 31.  
*Turbinate*, shaped like a top or pear.  
*Twining*, winding round other bodies.  
*Two-edged stem*, compressed, with two opposite sharp edges.  
*Two-ranked*, with leaves or branches spreading in two opposite directions.

## U.

*Umbel*, flower-stalks of nearly equal length, arising from a common centre.  
*Umbelliferous*, bearing umbels.  
*Umbellules*, the secondary divisions of an umbel.  
*Umbilicate*, marked with a central depression.  
*Unarmed*, destitute of prickles or spines.  
*Uncinate*, hooked.  
*Undivided*, without segments.  
*Undulated*, having a waved margin. 44.  
*Unequal*, some longer than others.

*Unilateral*, growing all on one side, or with the flowers leaning to one side.  
*Unilocular*, one-celled.  
*Unisexual*, being of one sex.  
*Ureolate*, pitcher-shaped.  
*Utricle*, a little bottle or bladder. 89.

## V.

*Vaginate*, sheathing. 38.  
*Valvular*, consisting of valves or seed-vessels.  
*Varicose*, swollen here and there.  
*Vascular*, consisting of tissue in a very succulent, enlarged state. 19.  
*Vaulted*, formed or placed like the roof of a vault.  
*Vegetable membrane*. 18.  
*Veined*, with a network of prominent vessels. 46.  
*Veins*, branching vessels.  
*Ventricose*, swelling; inflated.  
*Vernal*, belonging to the spring.  
*Versatile*, swinging lightly on a stalk so as to be continually changing its direction. 57.  
*Vertex*, the uppermost point.  
*Verticillate*, whorled; having leaves given off in a circle round the stem. 36.  
*Vesicular*, made of vesicles or little bladders.  
*Vesillum*, a standard; the upper petal of a papilionaceous flower. 55.  
*Villose* or *villous*, covered with soft hairs. 54.  
*Virescent*, green, flourishing.  
*Virgate*, twiggy.  
*Viscid*, thick, glutinous, covered with adhesive juice.  
*Viviparous*, bearing young plants in the place of flowers and seeds.

## W.

*Warty*, covered with small hard prominences.  
*Wedge-shaped*, broad at the end and tapering towards the base.  
*Wheel-shaped* corolla, with a short tube and expanded limb.  
*Whorl*, when several flowers encircle the stem.

*Whorled leaves or flowers*, growing in a circle round the stem.

*Wing* of a seed, a dilated membranous appendage.

*Wings*, the lateral pieces of a papilionaceous corolla.

*Winged stem*, with edges extended into leafy borders.

*Wood*. 32.

*Woody*, hard and solid.

*Woolly*, covered with long, soft, interwoven hairs.

*Wrinkled leaves*, when the veins are tighter than the substance between them, so that the latter is puckered. 46.

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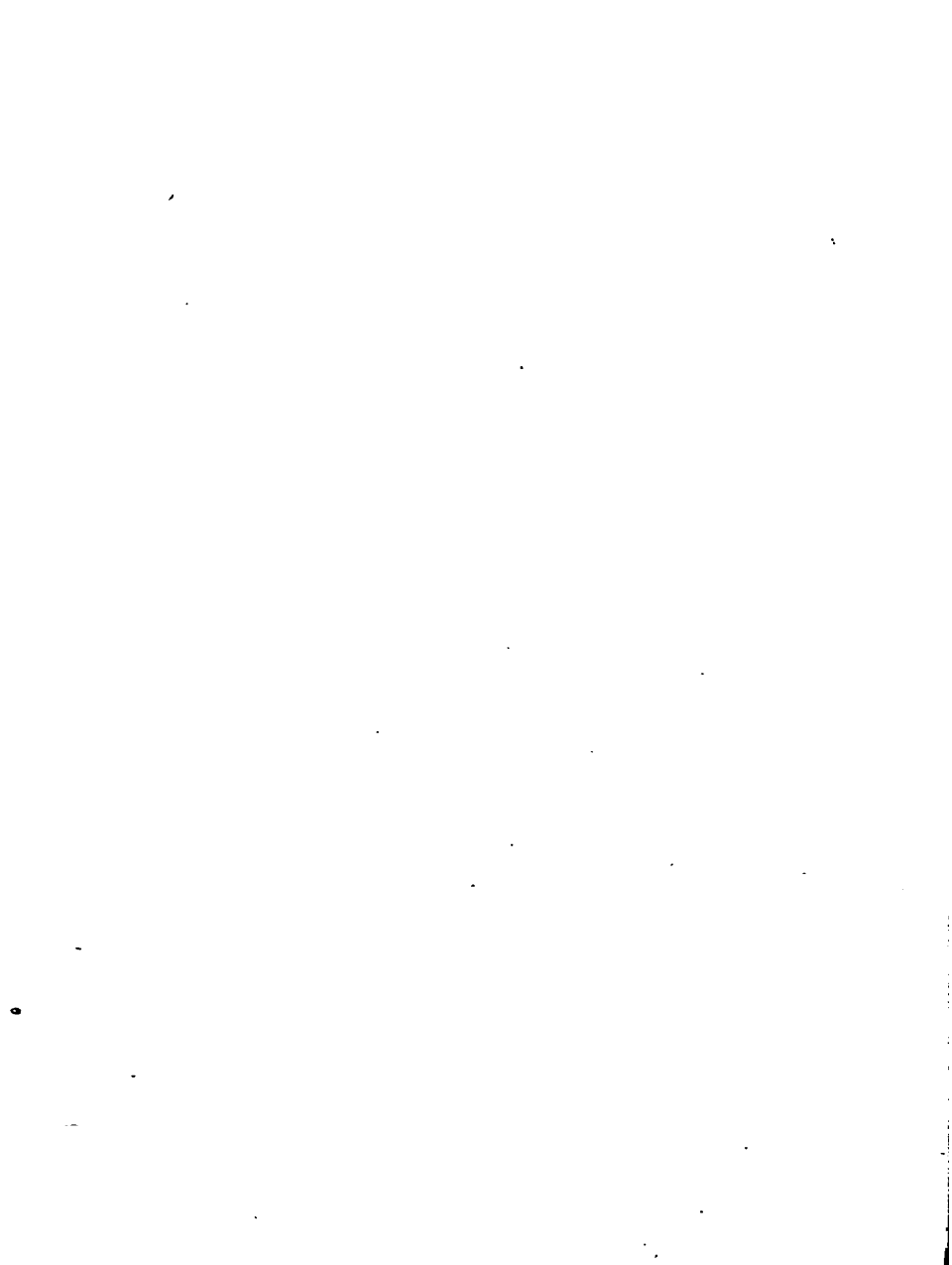









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